证　明

本证明之附件是向本局提交的下列专利申请副本

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申请类别：　发明

发明创造名称：　用于多媒体消息业务的互动方法、用户终端及其通信系统

申　请　人：　国际商业机器公司

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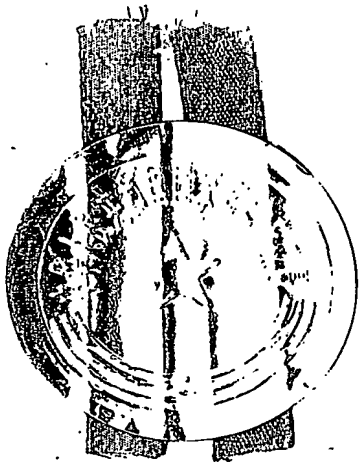


中华人民共和国
国家知识产权局局长　王景川

2003 年 12 月 12 日

权　利　要　求　书

1、一种用于多媒体消息业务的互动方法，包括以下步骤：

从服务器接收多媒体消息；

在用户终端上生成显示或播放多媒体消息的页面，其中，在所显示或播放的多媒体消息内嵌入一个或多个控件，多个控件之间定义了关联关系；

响应所述一个或多个控件的操作，触发至少一个动作事件并执行相应的动作。

2、根据权利要求 1 的方法，其特征在于，生成显示或播放多媒体消息的页面的步骤进一步包括：

解析所接收的多媒体消息，以获得所述多媒体消息的表示结构；

根据所述多媒体消息的表示结构，生成用于显示或播放多媒体消息的页面的数据模型。

3、根据权利要求 1 的互动方法，其特征在于，

所触发的动作事件是：向提供所述多媒体消息的服务器返回一个响应消息；以及，

进一步包括步骤：

响应于所述控件的操作，自动生成提交定单请求的响应消息。

4、根据权利要求 1 的互动方法，其特征在于，

所触发的动作事件是：改变所述多媒体消息内容；以及

进一步包括步骤：

响应于所述控件的操作，显示或播放改变的消息内容。

5、根据权利要求 1 至 4 其中之一的互动方法，其特征在于，还包括步骤：

所述关联关系至少包括链接关系和包含关系其中之一。

6、根据权利要求 1 至 4 其中之一的互动方法，其特征在于，还包括以下步骤：

解析所接收的多媒体消息，以获得有关动作规则的动作列表；

根据动作列表，监听所触发的动作事件。

7、根据权利要求 1 至 4 其中之一的互动方法，其特征在于，描述多媒体消息的语言是 XForms、XML、SMIL、XHTML 或 HTML 语言。

8、根据权利要求 1 至 4 其中之一的互动方法，其特征在于，所述控件包括：提交定单按钮、选择按钮、单选按钮、复选框、文本区、文本字段、列表框、选项菜单之一。

9、一种用于多媒体消息业务的用户终端，用于从服务器接收多媒体消息并对所述多媒体消息进行处理，所述用户终端包括：

装置，用于从服务器接收多媒体消息；

装置，用于生成显示或播放多媒体消息的页面；

装置，用于在所显示或播放的多媒体消息内嵌入一个或多个控件，多个控件之间定义了关联关系；以及

装置，用于响应所述一个或多个控件的操作，触发至少一个动作事件并执行相应的动作。

10、根据权利要求 9 的用户终端，其特征在于，用于生成显示或播放多媒体消息的页面的装置还包括：

装置，用于解析所接收的多媒体消息，以获得所述多媒体消息的表示结构；

装置，用于根据所述多媒体消息的表示结构，生成用于显示或播放多媒体消息页面的数据模型。

11、根据权利要求 9 的用户终端，其特征在于，

当所触发的动作事件是向提供所述多媒体消息的服务器返回一个响应消息时，响应于所述控件的操作，所述触发动作事件并执行相应动作的装置自动生成提交定单请求的响应消息。

12、根据权利要求 9 的用户终端，其特征在于，

当所触发的动作事件是改变所述多媒体消息内容时，响应于所述控件的操作，所述触发动作事件并执行相应动作的装置显示或播放改变的消息内容。

13、根据权利要求 9 至 12 其中之一的用户终端，其特征在于，所述关联关系至少包括链接关系和包含关系之一。

14、根据权利要求 9 至 12 其中之一的用户终端，其特征在于，还包括：

装置，用于解析所接收的多媒体消息以获得有关动作规则的动作列表；

装置，用于根据动作列表，监听所触发的动作事件。

15、根据权利要求 9 至 12 其中之一的用户终端，其特征在于，描述多媒体消息的语言是 XForms、XML、SMIL、XHTML 或 HTML 语言。

16、根据权利要求 9 至 12 其中之一的用户终端，其特征在于，所述控件包括：提交定单按钮、选择按钮、单选按钮、复选框、文本区、文本字段、列表框、选项菜单之一。

17、一种用于多媒体消息业务的通信系统，所述系统包括：

一个或多个用户终端；

一个或多个向所述用户终端发送多媒体消息的服务器，其特征在于，所述用户终端包括：

装置，用于从服务器接收多媒体消息；

装置，用于生成显示或播放多媒体消息的页面；

装置，用于在所显示或播放的多媒体消息内嵌入一个或多个控件，多个控件之间定义了关联关系；以及

装置，用于响应所述一个或多个控件的操作，触发至少一个动作事件并执行相应的动作。

18、根据权利要求 17 的通信系统，其特征在于，用于生成显示或播放多媒体消息的页面的装置还包括：

装置，用于解析所接收的多媒体消息，以获得所述多媒体消息的表示结构；

装置，用于根据所述多媒体消息的表示结构，生成用于显示或播放多媒体消息页面的数据模型。

19、一种用于在多媒体通信系统中的用户终端上运行的计算机程序，其中所述多媒体通信系统包括：一个或多个用户终端；一个或多个向所述用户终端发送多媒体消息的服务器，所述计算机程序在所述用户终端上运行，用于执行以下步骤：

从服务器接收多媒体消息；

在用户终端上生成显示或播放多媒体消息的页面，其中，在所显示或播放的多媒体消息内嵌入一个或多个控件，多个控件之间定义了关联关系；

响应所述一个或多个控件的操作，触发至少一个动作事件并执行相应的动作。

20、根据权利要求 19 的计算机程序，特征在于生成显示或播放多媒体消息的页面的步骤进一步包括：

解析所接收的多媒体消息，以获得所述多媒体消息的表示结构；

根据所述多媒体消息的表示结构，生成用于显示或播放多媒体消息的页面的数据模型。

21、根据权利要求 19 的计算机程序，特征在于包含以下步骤：

当所触发的动作事件是向服务器返回一个响应消息时，响应于所述控件的操作而自动生成提交定单请求的响应消息。

22、根据权利要求 19 的计算机程序，特征在于包含以下步骤：

当所触发的动作事件是改变所述多媒体消息内容时，响应于所述控件的操作，而显示或播放改变的消息内容。

23、根据权利要求 19 至 22 其中之一的计算机程序，特征在于包含以下步骤：

在所述多个控件之间至少建立链接关系和包含关系之一。

24、根据权利要求 19 至 22 其中之一的计算机程序，特征在于进一步执行以下步骤：

解析所接收的多媒体消息以获得有关动作规则的动作列表；

根据动作列表，监听所触发的动作事件。

25、根据权利要求 19 至 22 其中之一的计算机程序，其特征在于，

描述多媒体消息的语言是 XForms、XML、SMIL、XHTML 或 HTML 语言。

说　　明　　书

用于多媒体消息业务的互动方法、用户终端及其通信系统

技术领域

本发明涉及通信技术领域，特别地涉及用于多媒体消息业务的互动方法、用户终端及其通信系统。

背景技术

短信业务（SMS）作为一项极具吸引力的增值业务，越来越成为以话音业务为主导的移动通信网络的另一个重要业务领域。种类繁多的数据增值业务是基于短消息这种移动数据通信手段的，如手机银行、手机证券、信息点播、无线电子邮件、无线数据和传真等。在这里把这些业务统称为短信业务（或称短消息业务）。

SMS是基本的数据业务，当前无线用户使用SMS能发送最多160字符的简单文本消息。随着通信技术的发展，SMS已经从简单的通知方法发展为增值业务的多样化的平台。

例如，参照附图1，附图1示意性示出了无线用户使用基于SMS的增值业务的常规方案。例如，如果用户希望通过SMS获得IBM的当前股票报价，该用户必须找到IBM股票报价服务代码（即SQ）、服务提供者接入号（即消息中心号码123456），并且输入命令格式（即服务代码+公司名：SQ IBM），之后向信息中心发送，以请求所需要的有关IBM股票报价的信息。信息中心（或网络服务器）接收到用户的请求后，作为应答，向用户提供用户所请求的内容。尽管记住和输入与此请求相关的内容是很麻烦的，但基于SMS的增值业务还是为移动用户提供了便利来访问和获取信息。

由于现有短信业务主要以支持较短的文本为主。因此，今后的发展，要求短信内容更多的向多媒体内容发展。而这类增强型短信业务

的最大的特色是要支持多媒体消息，以可以传送视频片段、图片、声音和文字。随着短信业务的技术升级，提出了多媒体消息业务（MMS）。

MMS 是短信技术自然发展的结果。MMS 的工业标准是由两个组织，WAP Forum（WAP 论坛）和 3GPP（3G Partnership Project: 3G 伙伴计划）所制订的。因此，MMS 是设计成可以在 WAP 协议的上层运行，它不局限于某种传输方式，既支持电路交换数据（Circuit-Switched Data）通信，也支持通用分组无线业务 GPRS（General Packet Radio Service）数据通信。就目前而言，MMS 使用 WAP-push 技术，这类似于 SMS 的存储与转发功能，所以从本质上说，当前的 MMS 技术还是一种存储然后转发的技术。这意味着当手机用户发送一条 MMS 消息时，这条消息并不是由接受者直接收到，而是由用户所在网络的多媒体消息中心先一步接收到，然后多媒体消息中心向接收者发送一条通知指令，通知接收者从多媒体消息中心下载消息。在 SMS 系统中，也有这样的消息中心，但因为发送的消息都是文本，所以工作比较简单，然而对于 MMS 而言，消息中心的工作就比较复杂，因为其将不仅仅依赖于某个运营商的某个网络了，例如如果接收者是处于一个较慢的网络，或者他的手机屏幕尺寸不一样大，那么 MMS 运营商的设备需要能够检测这些情况，并且定制相应的消息格式。

MMS 是一种新的全球化消息通信标准。它最大的特点就是支持多媒体功能。多媒体信息使得具有功能全面的内容和信息得以传递，这些信息包括图象、音频信息、视频信息、数据以及文本等多媒体信息，在 GPRS 网络的支持下，以 WAP 无线应用协议为载体传送视频片段、图片、声音和文字。在标准组织制定 MMS 规范时，考虑将 MMS 作为一个应用的承载平台，不仅作为消息的存储-转发中心，而且要在 MMS 上开展各种丰富的应用。要让用户通过支持 MMS 的移动终端享受到与传统 Internet 一样的内容服务和感受。由于 MMS 可以支持丰富的数据格式，例如图形、声音、动画格式标准，因此希望通过 MMS 为用户提供与传统 Internet 完全一样的感受，甚至希望未来在带宽允

许的情况下，可以支持多媒体数据流，以大大提高消息的表达能力和丰富消息的内容。尽管 MMS 能力的巨大增长，丰富了用户的感受并为网络运营商和内容服务运营商创造了新的、主要的赢利来源。但是，当前 MMS 标准存在的主要缺陷或不足是：MMS 还处于“简单通信”的状况，即目前所推出的短信业务，大多是单向的，一般不具有内容来源或供应商和终端用户之间的互动。虽然也提出了在用户终端和服务器（或内容、服务供应商）之间提供一些互动性---但也仅限于移动用户使用移动终端发出消息对信息需求做出回复”这种互动性，不能真正满足用户实时对信息互动的需求，限制了增值 MMS 业务的开发。

MMS 是 SMS 的自然演化。但 MMS 比 SMS 传递更丰富的内容。MMS 提供友好和生动的表示方法。但是，MMS 业务是从 SMS 发展而来的，因此，根据现有技术，用户需要自己编辑请求消息。并且当前大多数 MMS 应用仅关注讨论如何发送和显示图象、铃声和文本，而没有谈论如何充分利用 MMS 的特点来丰富和增强用户在 MMS 增值业务中的感受，特别是大多数 MMS 应用不关心如何提供或增强用户与服务器（例如提供 MMS 内容的服务器）之间的互动业务，以及针对一条服务器提供的 MMS，不能在用户移动终端实现更有意义的本地互动。例如，在用户终端上还不能实现对所接收的多媒体消息中的各个信息项进行关联操作，在用户终端显示的多媒体消息内容很有限，并且用户需要通过多次操作，或者通过对所显示的信息项进行操作获得进一步的信息，或者通过编辑请求信息进而向服务器发送所编辑的请求来获得更多的信息。可想而知，不仅用户能获得的消息内容有限，而且用户的操作繁琐，这都降低了用户从多媒体消息中获得的感受。

在附图 2 中，简单示出了 MMS 的消息结构。其中，多媒体消息包括 MMS 报头和消息体。MMS 报头包括有关将多媒体消息如何从源发送到接收者的信息，例如源地址、目标地址等信息。MMS 消息体包括几部分，例如包括：媒体对象，例如图象（jpeg 格式），文本（明文格式），音频（wav 格式），每个对象占一个单独的部分，以及可选的表示部分。表示部分包含解释应如何提供多媒体内容的指令。对

于如何将表示显现出来的计算机表示语言，现有技术中，有多种备选方案。

一种本领域技术人员常使用的表示语言，是同步多媒体集成语言（SMIL）。SMIL是用于MMS表示语言的常用布署。它是将多媒体集成到 Web 内容的重要方法。SMIL 是一种基于可扩展标记语言（XML）的语言。可以使用 XML 语言描述多媒体表示的定时、将超链接与媒体对象关联以及定义屏幕表示的布局。SMIL 被看作是一种丰富当前基于文本消息传递技术的方法。XML 语言包括一组模块，为特定的功能区定义了语法（Semantic）和语义（Syntax）。例如这些模块是布局模块，计时和同步模块以及动画模块。但是，SMIL 语言的局限性在于它仅描述如何在屏幕上显示消息，并不为终端用户提供任何互动的特性。因此，需要对SMIL语言进行扩展，以使扩展的SMIL语言能够支持互动表示，而由此产生的优化的互动消息为用户提供更好的感受，从而使MMS技术在更广泛的应用领域大众化。

另一种本领域技术人员常使用的表示语言是超文本链接标记语言（HTML）。HTML 语言是在 Web 应用中支持互动表示的最大众化的语言。但HTML表单（以HTML文件形式出现的表格）不能用于MMS，因为HTML表单不能将内容从表示中分离出来，也就是说，HTML表单往往将表示和数据混在一起。事实上，各种MMS用户终端具有完全不同的能力，而如果能将内容和表示分离就能支持不同的MMS用户终端。这对于MMS消息表示语言也是一项基本的要求。另外，网络服务程序所用的协议，例如超文本传输协议（HTTP）的通信模式是请求/响应模式。这种模式导致了在服务器和用户移动终端之间需要多次往复。MMS是在大范围无线网络上运行的消息系统。它不是一个实时系统。如果可以实现请求/响应模式，则服务器和用户移动终端之间的往复将会造成巨大的延迟并降低整个系统的性能。因此，需要在MMS用户终端上以最佳的方式显示更丰富的动态表单。

发明内容

因此，本发明针对现有技术中存在的上述问题，提出了一种用于多媒体消息业务的互动方法。

本发明的一个目的，是在用户与MMS后台系统，例如提供多媒体消息的服务器，之间实现互动多媒体通信，优选地，针对一条由服务器提供的多媒体消息，在用户移动终端能自动生成返回给服务器的响应消息，而无需在用户终端和服务器之间进行多次交互操作，并且根据本发明的方法，可以在用户终端实现灵活、丰富、方便的本地互动。

本发明的另一个目的是为用户提供优化的 MMS 消息的用户界面。为此，本发明在多媒体消息中嵌入一个或多个互动控件，用户通过操作所述的一个或多个具有关联关系的互动控件，实现用户终端的本地互动以及用户终端与服务器（例如发送多媒体消息的服务器）之间的互动。

本发明的再一个目的是使用XForms语言创建在用户终端上显示的动态Web表单，优选地在一个消息显示页面内包括多个动态表单。从而提供更丰富的互动显示，为用户提供更优化的多媒体消息，增强用户的感受。

为实现本发明的上述目的， 根据本发明，提出了一种用于多媒体消息业务的互动方法，包括以下步骤：从服务器接收多媒体消息；在用户终端上生成显示或播放多媒体消息的页面，其中，在所显示或播放的多媒体消息内嵌入一个或多个控件，多个控件之间定义了关联关系；响应所述一个或多个控件的操作，触发至少一个动作事件并执行相应的动作。

在本发明的一种实施方式中，所触发的动作事件是向提供所述多媒体消息的服务器返回一个响应消息，为此，响应于所述控件的操作，自动生成提交定单请求的响应消息。

在本发明的另一实施方式中，所触发的动作事件是改变所述多媒体消息内容，为此，响应于所述控件的操作，显示或播放改变的消息内容。

其中，生成显示或播放多媒体消息的页面的步骤进一步包括：解析所接收的多媒体消息，以获得所述多媒体消息的表示结构；根据所述多媒体消息的表示结构，生成用于显示或播放多媒体消息的页面的数据模型。

根据本发明的另一个方面，提出了采用本发明方法的用于多媒体消息业务的用户终端，所述终端从服务器接收多媒体消息并对所述多媒体消息进行处理，所述用户终端包括：装置，用于从服务器接收多媒体消息；装置，用于生成显示或播放多媒体消息的页面；装置，用于在所显示或播放的多媒体消息内嵌入一个或多个控件，多个控件之间定义了关联关系；以及装置，用于响应所述一个或多个控件的操作，触发至少一个动作事件并执行相应的动作。

根据本发明的再一个方面，还提出了一种用于多媒体消息业务的通信系统，所述系统包括：一个或多个用户终端；一个或多个向所述用户终端发送多媒体消息的服务器，所述用户终端包括：装置，用于从服务器接收多媒体消息；装置，用于生成显示或播放多媒体消息的页面；装置，用于在所显示或播放的多媒体消息内嵌入一个或多个控件，多个控件之间定义了关联关系；以及装置，用于响应所述一个或多个控件的操作，触发至少一个动作事件并执行相应的动作。

根据本发明的用于多媒体消息业务的互动方法、用户终端和相应的通信系统以及相应的计算机程序，为多媒体消息业务的服务提供商提供了生成基于增值业务的消息的方法；为 MMS 用户提供了友好的用户界面，该用户界面可以以最佳的方式显示更丰富的动态表单；并为MMS用户发送服务请求提供了更便利的途径；根据本发明，MMS用户可以访问更多的信息而在服务器和用户移动终端之间所使用的通信往复更少，同时不会占用过多的系统资源，也不会造成延迟。根据本发明的方法，改善了消息服务系统的性能。

附图说明

本领域普通技术人员可以理解，本发明的其它的优点和特点在以

下通过参考附图和对具体实施方式的描述中，将会变得更显而易见。

以下通过结合附图，对本发明的实施方式进行详细描述，其中：

图 1 示意性示出了一种在用户终端上显示的 SMS 消息界面；

图 2 示意性示出了常规多媒体消息的消息结构；

图 3 示意性示出了应用本发明方法的 MMS 通信系统的框图；

图 4 示意性示出了根据本发明的用于多媒体消息业务的互动过程；

图 5 示意性示出了根据本发明的用于多媒体消息业务的互动方法的处理过程的流程图；

图 6 示出了根据本发明的互动控件的逻辑模块；

图 7 示意性示出了根据本发明的其中一种互动控件；

图 8 示意性示出了根据本发明方法进行互动多媒体消息业务的例子；

图 9 示意性示出了根据本发明方法的多媒体消息的数据模型；

图 10 示意性示出了根据本发明在实现多媒体消息业务的互动方法中，在所描述的例子中的多媒体消息的消息数据模型；

图 11 示意性示出了根据本发明方法的用户界面中间处理软件模块的功能图。

具体实施方式

以下通过参考附图，对本发明的具体实施方式进行描述。应当理解，以下给出的描述使得本领域的普通技术人员能够实现本发明。对于本发明的各种修改对于本领域的普通技术人员来说都是显而易见的，并且本发明提出的原理也可以应用到其它的实施方式中。因此，本发明并不限于以下所描述的实施例。

参照附图 3，附图 3 示意性示出了根据本发明的 MMS 通信系统的框图。MMS 通信系统用于激活互动多媒体消息，实现在用户移动终端和服务器，例如提供多媒体消息的服务器之间的通信。MMS 通信系统一般包括三个主要的部分：MMS 增值业务服务器 300，通信网络及

MMS 中心（MMSC）200，以及一个或多个 MMS 终端 100。MMS 增值业务服务器 300 提供和发送多媒体消息，并能够以消息模式接收来自 MMS 终端 100 的服务请求，MMS 增值业务服务器 300 优选地可包括：通信模块 301，消息解析模块 302，以及一个或多个业务模块 303。通信模块 301 用于处理 MMSC 200 和服务器 300 之间的各种可能的通信协议，例如：HTTP 或 SMTP。消息解析模块 302 分析呼入的请求消息，例如来自 MMS 终端 100 的请求消息，从所接收到的消息中，根据消息报头中所携带的相关信息，解析出要显示消息的格式、内容，然后将请求消息传递给相应的业务模块 303。业务模块 303 用于处理业务的逻辑。通信网络和 MMSC 200 可由电信运营商提供。MMS 终端 100 可以是任何可进行多媒体消息通信的通信装置，可以是单独的多媒体通信装置，也可以是具有进行多媒体消息通信能力、功能及相应硬件结构的其它各种通信装置，MMS 终端包括但不限于：移动电话、个人数字助理（PDA）等。 通常，MMS 终端 100 具有运行客户应用程序的 MMS 模块组件 110，用于在 MMS 终端 100 上执行多媒体客户应用程序。通过运行 MMS 模块组件 110 上的客户应用程序，实现在 MMS 终端 110 上的本地互动以及 MMS 终端 100 与服务器 300 之间的互动。MMS 模块组件 110 优选地至少包括四个部件：通信模块 111；解析模块 112；互动模块 113；以及消息存储模块 114。其中，通信模块 111 主要通过处理各种 MMS 通信协议，经 MMSC 200 与服务器 300 进行通信。解析模块 112，对从服务器接收到的多媒体消息进行解析，从所接收的消息中读出有关要在 MMS 终端 100 上显示的消息格式的信息以及相关信息，进而对不同显示格式的消息做相应的处理。例如，当解析出所接收到的消息格式是图片时，则根据图片消息的格式显示图片信息；当解析出所接收到的消息格式是音频格式时，则播放该音频消息；当解析出所接收到的消息格式是文本格式时，则显示文本内容。互动模块 113，根据对所接收的多媒体消息解析出的媒体对象之间的关联关系，对多媒体消息表单中的各个控件执行相应的关联操作，以实现 MMS 终端 100 上的本地互动以及用户与服务器

之间的互动。存储模块 114，用于存储所接收的消息以及所涉及的处理结果。

参见附图 4，附图 4 示意性示出了根据本发明的用于多媒体消息业务的互动过程。首先，在过程 I10 中，由服务器 300 向 MMS 终端 100，经通信网络及 MMSC 200 发送互动多媒体消息。该消息例如被发送一次并可以永久存储在 MMS 终端 100 中。

在过程 I20 中，示意性示出了 MMS 终端 100 进行本地互动的过程。本地互动过程主要是处理用户操作的过程，也就是说，用户对在用户界面上所提供的各种类型的表单进行操作，操作例如包括：添加、删除、修改、输入、选择、查找动作等。当然，用户可选择上述操作的一种或多种，也可以不进行任何操作。

根据需要，也可以实现 MMS 终端与服务器之间的互动。在过程 I31 中，将包含由用户输入或选择的数据的请求消息从 MMS 终端 100 发送给服务服务器 300。优选地，将带有所需服务结果的响应消息发送回服务器 300。

以下，进一步参照附图 5 对本发明的用于多媒体消息业务的互动方法进行详细描述。

附图 5 示意性示出了根据本发明的用于 MMS 业务的互动方法的处理过程的流程图。在该流程图中所示出的方法步骤，主要由上述 MMS 终端 100 中的 MMS 模块组件 110 完成，即通过在通信模块 111、解析模块 112、互动模块 113 中执行 MMS 模块组件 110 上运行的客户应用程序来实现本发明的方法。当然，此处对该实施方式只是示例性地进行说明，本发明并不局限于附图中所示出的结构。

参照附图 5，针对一条来自多媒体消息服务器 300 的多媒体消息（P1），在步骤 F1，由 MMS 终端 100 经 MMSC 200 接收该多媒体消息。解析模块 112 首先从所接收的消息数据中解析出消息的表示部分（P2）。表示部分（P2）常涉及要显示的消息内容。接下来，针对消息的表示部分（P2），在步骤 F2，进一步对消息的表示部分进行解析，即对如何显示消息的描述方面进行解析，从中获得显示的消息的

表示结构（P3），也就是有关要在 MMS 终端 100 上显示的消息格式。此外，对消息的表示部分进行解析时，还解析出规定控件之间的动作和关系的规则，并将动作和关系嵌入到动作列表（P8）中。根据解析出的表示结构（P3），在步骤 F3，根据不同的消息格式，例如文本格式、音频格式、或图象格式的消息格式，创建显示消息的数据模型或播放消息的数据模型（P4），该数据模型优选地通过标记语言来显示。针对所创建的用于显示或播放的数据模型（P4），在步骤 F4，装载相应的数据，产生消息页面（P5）。在步骤 F5 中，将产生的消息页面在 MMS 终端 100 上进行显示或播放。针对在 MMS 终端 100 上显示的多媒体消息（P6），用户可以对其进行操作，在步骤 F6 中，响应一个用户操作，产生一个相应的动作事件（P7）。对这一动作事件（P7），可在步骤 F8 中，使用动作监听器来对该动作事件进行监听，对动作事件进行处理，从而产生相应的动作。动作监听器是在步骤 F7 中，根据步骤 F2 中对表示部分进行解析而得到的关于对动作规则定义的动作列表生成的。在步骤 F9，针对由步骤 F8 所监听到的动作（P9），启动事件处理程序来对用户的动作进行处理。监听到的动作（P9），例如分为两类，一类是改变在 MMS 终端上显示的消息页面中的内容（P10），对于此类动作，重复步骤 F5，即根据动作列表中所定义的动作规则，对动作做相应的处理，进而在 MMS 终端 100 上重新显示或播放改变后的消息的页面。另一类动作涉及与服务器之间的互动，在步骤 F10，根据新的消息数据模型和相关数据，如果事件是有关发送消息的事件，则根据消息模型和用户的偏好生成消息，并将生成的消息发送给服务器 300。

根据本发明，在创建 MMS 显示模型时，在用户 MMS 终端上显示的一个多媒体消息表示界面中提供一个或多个互动控件，在所述页面内提供多个表单。所述互动控件可以是提交定单按钮，单选按钮、复选框、文本区、文本字段、列表框、选项菜单等等。每个控件可以分配一个名字。当表单被提交时，一些控件（取决于控件的状态）的名称和当前值可以随表单一起发送。通过将互动控件嵌入到多媒体消

息中，用户可以通过操作这些互动控件，将用户的喜好表达给服务应用程序，以提供互动方案。

参照附图 6，附图 6 示出了根据本发明的互动控件的逻辑模块。

本发明通过对互动控件扩展来支持多媒体项目。所支持的多媒体项目可以是图象、音频、视频。单选按钮、复选框、列表框以及选项菜单的项目可以是图片、音频、视频剪辑。以选项菜单为例，选项菜单的项目可以是图片。每个图片代表一个项目。如图 7 的多媒体选项菜单所示。在图 7 中，示出了 Nokia 品牌的手机的型号（例如 Nokia2110，Nokia5110，Nokia6110，Nokia7250.....）以及每种型号的 Nokia 手机的图片。用户可以，例如点击不同型号的手机图片，而在用户终端—MMS 终端 100 的显示屏幕上，显示该型号的手机，用户也可以移动滑动框，来显示更多 Nokia 型号的手机和图片。

接下来，描述本发明所提供的这些互动控件之间的关系。采用逻辑模块来定义关系和动作。本发明所提出的互动控件之间的关系包括“链接”（LINK）和“包含”（CONTAIN）两种关系。举例来说，如果两个或多个控件之间具有“链接”的关系，则当选择这些控件项目中的一个时，同时也选择全部其他的项目。因此，当这些控件项目中的一个显示时，所有其他的项目也被显示或播放。如图 6 所示。当手机型号从 Nokia 5100 变化为 Nokia 7250 时，相应地，对于每种型号的手机，其图片和价格也随之改变。“包含”是另一种关系。举例来说，如果控件 A 的项目 1 包含控件 B 的项目 1 到 7，则当选择控件 A 的项目 1 时，仅控件 B 的项目 1 到 7 被选择。

根据本发明，首先，对现有 MMS 系统进行扩展，在用户终端上显示更丰富的动态表单，其中所显示的各个控件具有一定的关联关系，优选地，控件之间的关联关系被定义为链接关系或包含关系，以方便用户对显示的多媒体消息进行操作，从而为用户与后台系统之间的互动提供一种方便的途径。用户可以通过使用这些互动控件选择并输入他/她的喜好，并且根据本发明设计的互动控件能根据用户选择自动生成响应消息。用户按提交定单按钮，产生并发出响应消息。例如，自

动生成包含定购请求的响应消息—自动生成一个定单，发送回服务器。通过对 MMS 系统进行扩展，为消息服务者/用户提供公共方案以产生/操作增值业务。通过使用这些互动控件，为用户提供了非常友好的 MMS 消息的用户界面。当用户选择不同的参数时，消息以不同的表示结构显示。以此方式，用户可以完成本地互动或直接与消息服务器之间的互动。

本发明对现有 MMS 系统的扩展是通过将 XForms 技术嵌入到 MMS 表示语言中实现的。对当前 MMS 标准扩展以增强 MMS 消息的互动能力。扩展 XForms 以支持多媒体互动控件。互动控件之间的关系由基于 XML 的文档进行描述。例如，将关系描述命名为 Relationship XML （RXML）。而且，引入 MMS 中间软件系统处理互动多媒体消息业务。

XForms 是定义基于表单的互动界面的基于 XML 语言。XForms 是对使用 HTML 语言编写的 HTML 表单的更新。XForms 提供可扩展的方法以在 HTML 文档中包含更丰富、更动态的表单。更快速、方便地创建动态 Web 表单。XForms 通过将传统的 HTML 表单分成三个部分：数据模型、实例数据和用户界面。将表示与内容相分离，允许复用、并提供更强的输入功能。XForms 和 XMIL 都是基于 XML 的语言。能将 XForms 集成到 SMIL 中。XForms 提供各种互动控件，包括：提交按钮、单选按钮、复选框、文本区、文本字段、列表框、选项菜单等。

扩展这些互动控件以支持多媒体相关对象。例如可支持的多媒体对象可以是图片、音频、视频。单选按钮、复选框、列表框以及选项菜单的项目可以是图片、音频、视频剪辑。以选项菜单为例，选项菜单的项目可以是图片。每个图片代表一个项目。

根据本发明提出的互动控件之间的关系例如通过 XML 语言来描述。本发明对互动控件之间的关系定义为两种关系。它们是“链接”（LINK）和“包含”（CONTAIN）关系。最常用的关系是“链接”关系。举例来说，如果两个或多个控件之间具有链接的关系，当这些

控件项目中一个被选择时，也选择所有其它的项目。因此，当其中一个控件项目显示时，所有其他的项目也被播放或显示。“包含”关系是指：如果控件 A 的项目 1 包含控件 B 的项目 1 到 7，则当选择控件 A 的项目 1 时，仅选择控件 B 的项目 1 到 7。

以下，进一步通过举例来说明本发明所定义的互动控件之间的关系。

以摩托车的销售为例。用户接收到摩托车的促销消息（参见图 8，摩托车促销互动消息）并有兴趣购买一款摩托车。该用户仅通过从型号选项菜单中进行选择，就能同时预览各种摩托车的图片和价格（“链接”关系）。即，用户每选择一款摩托车型号，该型号下的摩托车图片和相应的价格也随之显示出来。并且，如果用户想要购买一款摩托车，例如 Buggy 牌的摩托车，仅需要选择型号并点击提交定单按钮（提交一定单），就可以了。

在附图 9 中，示意性示出了根据本发明的一种数据模型。其中，对象 1 包含在对象 2 中。对象 1 和对象 3 具有关联关系。对象 1 的属性 1 确定属性 2。如果对象 1 从一种情况变化到另一种情况，如属性 1 发生变化时，对象 2 和对象 3 也随之变化。

附图 10 示意性示出了在购买摩托车的例子中的消息数据模型。在表示结构部分，该消息的数据模型示出了五种选项，包括：摩托车牌子，摩托车型号 、摩托车车轮类型、摩托车图片、摩托车价格和提交定单按钮几个项目。一般的，实例数据根据数据模型给出实际的数据。两个消息可以具有相同的数据模型但不同的实例数据。在图 10 中，该实例数据是有关促销摩托车的信息。用户界面定义每个项目的位置、格式、大小。

关系或动作部分描述当事件发生时，对象和动作之间的关系。通常，消息包含有关一个或多个对象的信息，而不管这些信息如何示出。关系或动作部分描述了数据之间的内部关系。这些属性之间的内部关系是什么。例如，其它一些属性确定一个属性，或一个属性确定其他属性。还有这些对象之间的外部关系。

举例来说，在关系/动作部分，摩托车牌子、型号、图片、价格、车轮类型之间的关系如图 10 所示。摩托车类型具有一组型号，因此，摩托车对象包括型号对象。当选择摩托车类型时，属于该摩托车类型的型号能在型号选项菜单中被示出（“包含”关系）。每种摩托车型号对应各自的图片，但具有几种车轮类型，可被用户选择。可由型号和车轮类型确定价格。当用户按提交定单按钮时，由 MMS 客户应用程序编辑响应消息。根据按钮动作生成响应消息。

为了提供友好的互动特性以增强用户对 MMS 增值业务的感受。在本发明中，通过对业务的表示使用扩展的 XML 语言进行描述，如下所示：

```
<?xml version= "1.0" encoding= "ISO-8859-1"?>
<smil xmlns= http://www.w3.org/2001/SMIL20/Language
 xmlns: xfm= "http://www.w3.org/2002/01/xforms">
 <xfm: model id= "form1">
 <xfm: submitInfo id= "submit 1" method2= "postxml"
localfile= "temp.xml"
 target2= http://www.ibm.com/motopromote/"/>
 //attention A
 <xfm: instance xmlns= " ">
  <moto>
   <moto></moto>
   <model></model>
   <wheel></wheel>
 </moto>
 </xfm:instance>
  </xfm: model>
  <body>
 <par region= "preference">
  <xfm: optionmenu ref= "moto">
```

```
  <xfm: caption>1. Select the motor</xfm: caption>
  <xfm: item>Buggy</xfm:item>
 </xfm: option>
 <xfm: optionmenu ref= "model">
  <xfm: caption> 2. Select the model</xfm: caption>
  <xfm: item>Normal</xfm:item>
  <xfm: item>Model A</xfm: item>
  <xfm: item>Model B</xfm: item>
 </xfm: option>
 <xfm:optionmenu ref= "wheel">
  <xfm: caption>3. Select the wheels</xfm:caption>
  <xfm: item>Normal</xfm:item>
  <xfm: item>Enhanced</xfm: item>
 </xfm;option>
</par>
<par region= "submit">
 <xfm: submit name= "Submit" ref= "moto" to = "submit 1">
  <xfm: caption>Sbumit</xfm:caption>
  </xfm: submit>
</par>
//the img region to display the motor picture
<par region= "imgRegion" dur= "indefinite"/>
//attention B
 <xfm: optionmenu model= "picture" ref= "picture">
   <xfm: caption></xfm: caption>
   <xfm: item>buggy.jpg</xfm: item>
   <xfm: item>buggy_A.jpg</xfm:item>
   <xfm: item>buggy_B.jpg</xfm: item>
 </xfm:option>
```

```
<xfm: optonmenu ref= "price">
  <xfm: caption></xfm: caption>
  <xfm: item>$1250</xfm: item>
  <xfm: item>$1350</xfm: item>
  <xfm: item>$1399</xfm: item>
 </xfm: option>
</par>
  </body>
 </smil>
```

多媒体消息业务表示使用 SMIL 和 XForms 来描述消息的用户界面。互动控件以 XForms 再现。当 MMS 终端接收到消息，解析和提供表示以显示互动摩托车促销消息，类似图 8 所示。例如语句 "Attention A"表示响应消息格式。当用户按提交按钮，由 MMS 客户应用程序编辑响应消息。响应消息如下所述。

```
<?xml version= "1.0", encoding="ISO-8859-1"?>
 <moto>
    <moto>Buggy</moto>
    <model>Normal</model>
    <wheel>Normal</wheel>
 </moto>
</xml>
```

此外，本申请的重要特征是显示摩托车图片的多媒体选项菜单。例如，语句中 "Attention B"显示了多媒体互动控件的表示。

本申请另一个重要特征是控件模块之间具有逻辑关系。在此实施例中，是以型号、图片和价格的控件之间的 "链接"关系为例进行说明。当用户从（选择型号）选项菜单中选择型号时，该型号的相应的图片和价格也一同显示。在摩托车的集合和型号的例子中公开了 "包含"关系，如果选择一种摩托车的集合，该摩托车集合中的所有型号都可在随后的选项菜单中看到。而不属于该摩托车集合中的其它型号，

则不能被看到。

RXML 和多媒体控件项如以下 XML 文档所示。

```
//the relational XML describe the relationship between the controllers
//the link relation
//attention C
<relation name= "relation 1">
 <rxml: link>
    <item attr=xfm: optionmenu ref= "model">
    <item attr=xfm: optionmenu model= "picture" ref= "picture">
      <item attr=xfm: optionmenu ref= "price" >
        </rxml: link>
        <rxml: instant attr=normal>
        </rxml: instant>
 </relation>

//the contain relation
//attention D
<relation name= "relation 2">
 <rxml: contain>
    <item attr= xfm: optionmenu ref= "moto">
    <containitem att=xfm: optionmenu ref= "model">
 </rxml: contain>
 <rxml: instant>
    <item attr=xfm: item> Buggy </item>
    <containitem attr= xfm: item>Normal</containitem>
    <contanitem attr= xfm: item>Model A</containitem>
    <containitem attr=xfm: item>Model B</containitem>
```

<rxml:instant>
</relation>

根据本发明，为 MMS 业务提供者设计 MMS 业务中间软件以将 MMS 消息传递给用户，以及处理呼入消息，例如来自 MMS 终端的消息，以提供增值业务。一般地通过验证模块验证消息的发送者，验证模块使用用户管理数据库验证用户。验证之后，由消息解析器解析消息。然后，经消息解析器将消息传递给正确的消息业务进行处理。当业务发起消息后，由触发器验证消息，并经 MMS 界面发送出去。

用户界面定义尺寸、格式、位置、显示时间、界面参数的移动，用户界面定义如何将数据实例并入页面的表示。用户界面由用户界面处理软件（UI-ware）实现。UI-ware 是一种可以以预先定义的模式显示和互动的表单。参照附图 11，在图 11 中所示出的 UI-ware 可以是独立的项目，例如文本，图片，视频，音频或类似按钮、复选框、列表框、单选按钮、选项菜单、输入字段的表单控件。表单控件的项目可以是文本、图片、视频或音频。表单控件具有诸如通常 HTML 表单控件或 XForms 控件的相同的互动能力。在实施中，可使用 XForms 技术。对独立的项目没有重新定义互动能力，但是可以在关系/动作部分增加其互动能力。界面参数可以以各种 UI-ware 示出。例如，具有多项选择能力的界面参数可以在复选框或列表框中示出，因为它们都是多项选择控件。更重要的是，数据模型可被提供在各种 MMS 终端的各种表示中。

界面参数的互动能力描述为界面是否可以显示、播放、编辑、选择。是否为单一选择还是多项选择。例如，消息可以具有两种界面参数。一种为文本，该文本可以输入/修改。另一种为音频阵列，用户可以在一个时间从该阵列中选择项目。并且每个项目可以被播放。

以上通过实施例对本发明的用于多媒体消息的互动方法、用户终端及其通信系统进行了详细的描述。应当理解，本发明并不局限于所列出的实施例，根据本发明对实施例的描述，本领域技术人员根据本

发明的原理可以作出各种修改和改进，应当理解，所做出的各种修改和改进都不脱离本发明的精神和范围。

说　明　书　附　图

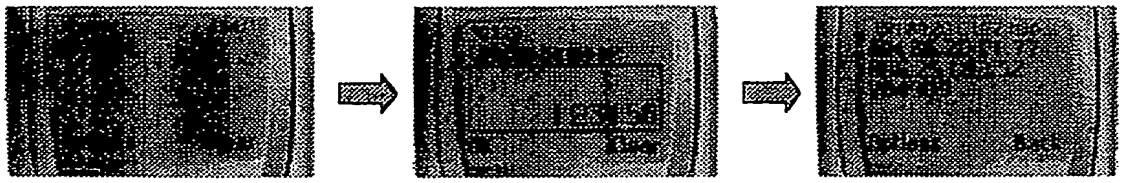


图 1

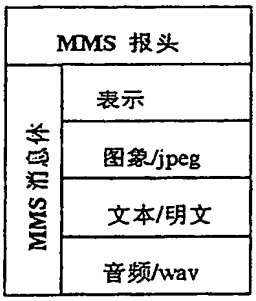


图 2

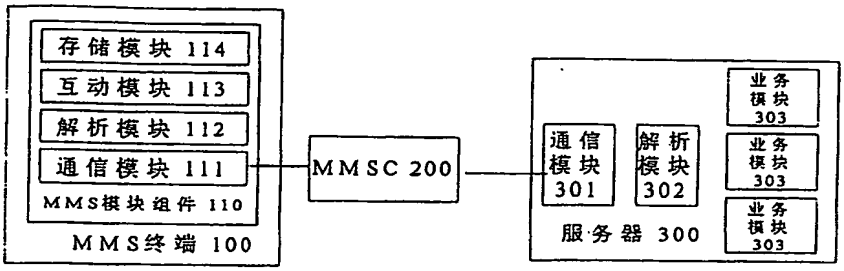

存储模块 114
互动模块 113
解析模块 112
通信模块 111
MMS模块组件 110
MMS终端 100
MMSC 200
通信模块 301
解析模块 302
业务模块 303
业务模块 303
业务模块 303
服务器 300

图 3

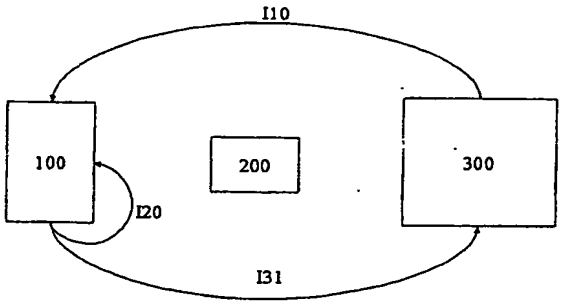

I10
100
200
300
I20
I31

图 4

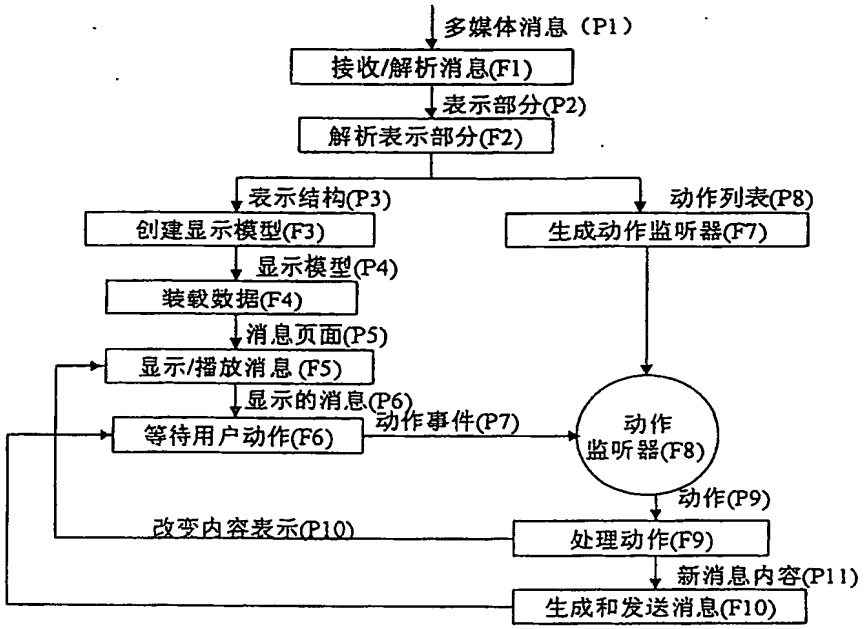

多媒体消息（P1）
接收/解析消息(F1)
表示部分(P2)
解析表示部分(F2)
表示结构(P3)
动作列表(P8)
创建显示模型(F3)
生成动作监听器(F7)
显示模型(P4)
装载数据(F4)
消息页面(P5)
显示/播放消息 (F5)
显示的消息(P6)
等待用户动作(F6)
动作事件(P7)
动作
监听器(F8)
动作(P9)
改变内容表示(P10)
处理动作(F9)
新消息内容(P11)
生成和发送消息(F10)

图 5

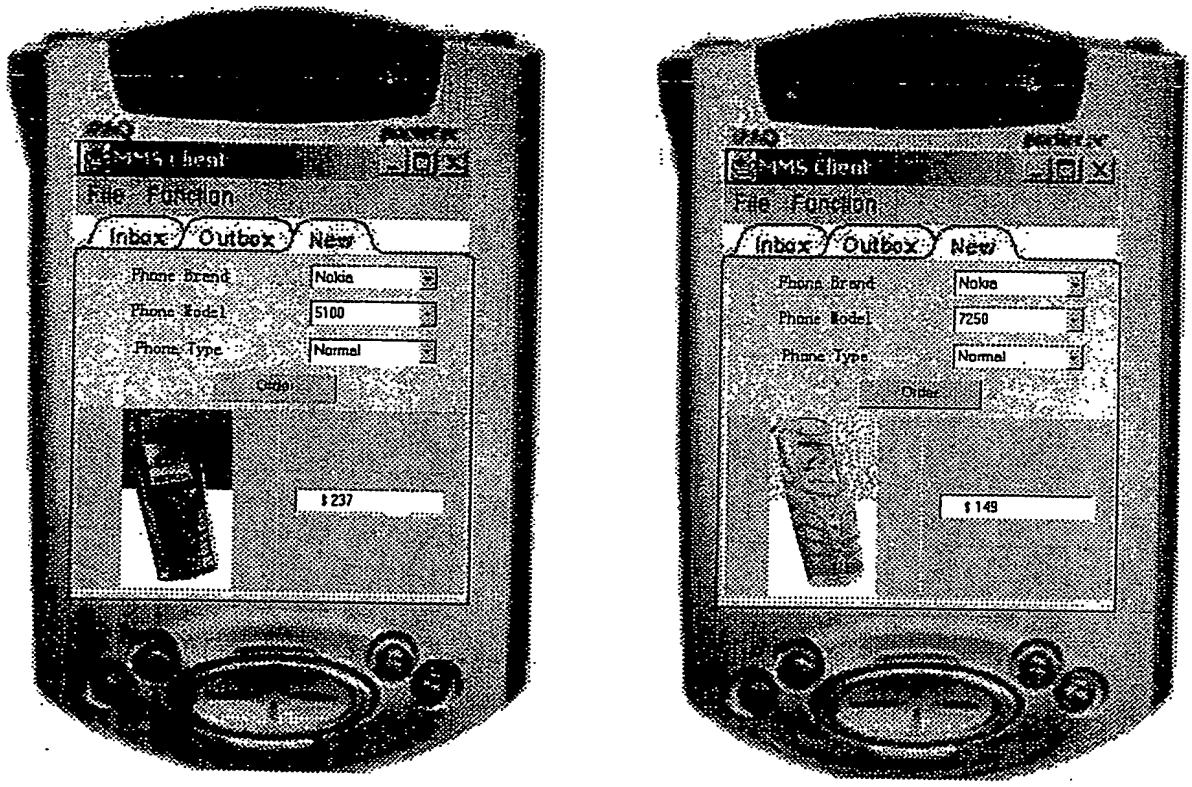

MMS Client
File Function
Inbox
Outbox
New
Phone Brand
Nokia
Phone Model
5100
Phone Type
Normal
Order
$ 237
MMS Client
File Function
Inbox
Outbox
New
Phone Brand
Nokia
Phone Model
7250
Phone Type
Normal
Order
$ 149

图 6

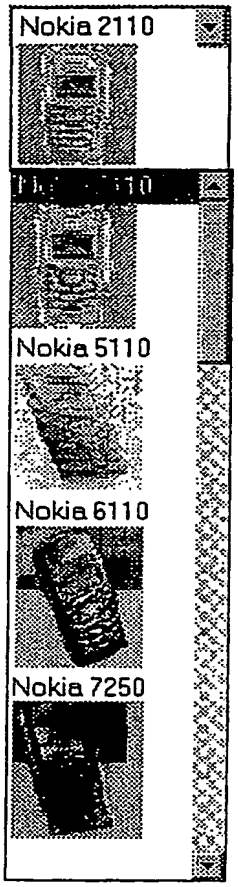


图 7

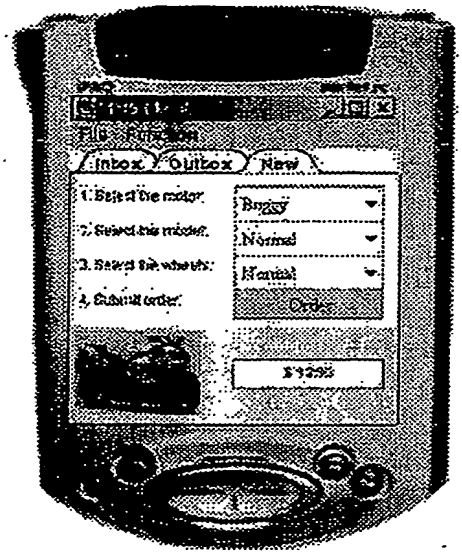

Inbox
Outbox
New
Busy
Normal
Normal

图 8

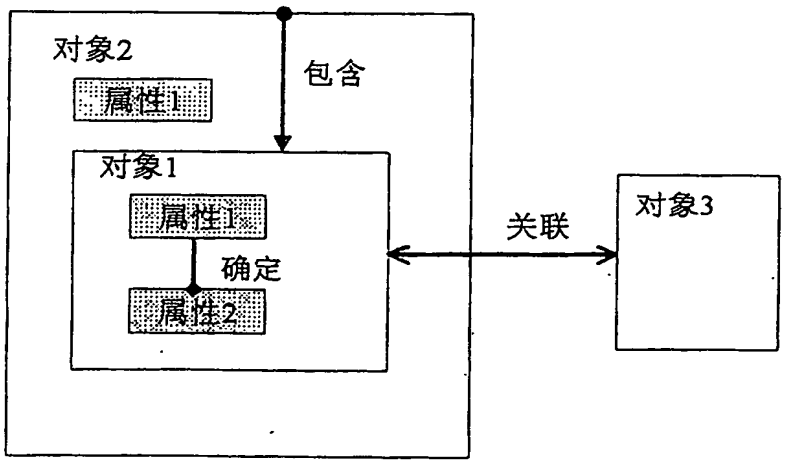

对象2
属性1
包含
对象1
属性1
确定
属性2
关联
对象3

图 9

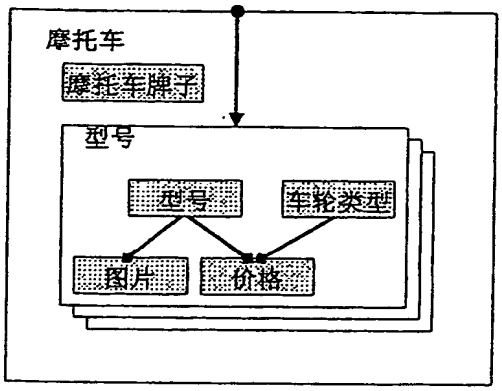

摩托车
摩托车牌子
型号
型号
车轮类型
图片
价格

图 10

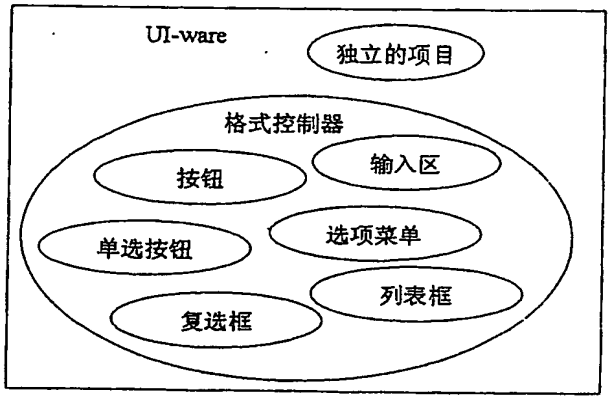

UI-ware
独立的项目
格式控制器
按钮
输入区
单选按钮
选项菜单
列表框
复选框

图 11

Translation Certificate

I, Jun Shen employee of IBM China Co., Ltd., of 2/F No.7, 5th Street, Shangdi, Beijing 100085, People's Republic of China, hereby certify that the attached is a true and whole translation of the certified copy of the Chinese Patent Application No. 03138197.9 filed on May 29, 2003 by International Business Machines Corporation to the best of my knowledge and belief.

Dated this 5 of Feb, 2004

Shen Jun

(signature)

An Interactive Method For Multimedia Message Services, a User Terminal and a Communication System For The Same

FIELD OF THE INVENTION

The present invention generally relates to the communication technology, and in particular to an interactive method, a user terminal and a communication system used for multimedia message services.

BACKGROUND OF THE INVENTION

As a very attractive value-added service, the short message service (SMS) increasingly becomes another important service area in mobile communication networks involved voice service as a leading function. A wide range of different value-added data services are based on this kind of mobile data communication means of short message such as mobile phone bank, mobile phone securities, information on-demand, wireless e-mail, wireless data communication and fax etc. All these are referred to "short message service" (or SMS) in general.

SMS is a fairly basic data service that enables a wireless subscriber to send simple text messages of up to 160 characters at the present. SMS has, as a result of the development in communication, been developed from a simple notification means to a versatile platform for value-added services.

Taking fig.1 for example, where a conventional solution is shown for SMS based value-added services adopted for wireless subscribers. For example, if a user wants to ask for a current stock quote of IBM via SMS, he or she has to find the IBM stock quote service code (SQ) and the service provider access number (i.e. message center number, e.g. 123456), and input the command format (i.e. the service code plus the company name: SQ IBM), then sends this to a message center to request the desired information about the stock quote of IBM. Upon receiving a request from a subscriber, the message center (or network server) provides the content requested by the subscriber in response. Although it is very troublesome to remember and input the contents relating to this kind of requests, the SMS based value-added service gives users the convenience to access and to acquire information.

Because the current short massage service supports mainly relatively short texts, the henceforth development in contents of the short messages will be focused on multimedia contents. The most prominent feature of this kind of richer short message service, however, is to support multimedia messages to pass on video clips, pictures, audio samples and text. Multimedia message service (MMS) has been proposed in consequence of the technical upgrades in the short message service.

MMS is the natural evolution of SMS. The messaging standard for MMS is set up by two organizations, WAP (Wireless Application Protocal)

Forum and 3GPP (3rd Generation Partnership Project). Therefore MMS is designed to operate at upper levels of the WAP protocol, without limitation to a certain art of transmission, supporting both the circuit-switched data communication and the general packed radio service (GPRS) data communication. As a current situation, MMS adopts WAP-push technique, which is a store & transmits function similar to that of SMS, and therefor the current MMS technique remains yet a store/transmit one. This means that if a message is sent by a Handset, a recipient will not receive it directly. Instead of that, the massage is received in advance by a multimedia message center of the network which the subscriber resides in, and then the multimedia message center sends a notification to the recipient informing that the recipient should download the message from the multimedia message center. Similar multimedia message center exists also in MSM systems, but as all the messages to be sent are text ones, so it is relatively simple in operation. Whereas by MMS, the operation in the message center is relatively complex as it will not rely on a certain network of a certain operator, so if, for example, the recipient resides on a slower network, or his/her handset's screen has a different size, the equipment at the operator needs to be able to detect the situations and to configure a corresponding message format.

MMS is a new global message communication standard, the most

prominent feature of which is the supporting of multimedia applications. The multimedia message enables contents and pieces of information with a full range of functions, including images, audio information, video information, data and text, to be transferred, and video clips, pictures, voice and text, supported by a GPRS network, to be transferred, by taking advantage of WAP protocol as a carrier. When the MMS specification was constituted by the standard organization it was once conceived that MMS should be an applications bearing platform serving not only as a store-forward center for messages but performing various enriched applications. Through a mobile terminal supported by MMS a user should enjoy the same content services and experiences, as he or she would get through the classical Internet. As MMS can support a wide range of data format standards, such as image format, audio format, animation format standard, that entirely the same experience as get from the internet is therefor desired to be available for user by MMS, or even multimedia data stream support is expected, when, in future band width allows this, to greatly enhance the message expression capability and enrich message contents. MMS promises a dramatic increase in messaging capabilities that will enrich user experience and create a major new source of revenue for network operators as well as content and service providers. However, a primary shortcoming or imperfection of the current MMS standard is that MMS is still in a situation of "simple

communication", that is to say, most of the short message services available at present are unidirectional, generally do not provide interaction between content sources or providers and end users. Although some features of interaction between end users and servers (or content and/or service providers) have been proposed, involved only in those features that a mobile subscriber send a message with a mobile terminal to reply a information request, which do not satisfy real time demands for information interaction from users, and this fact limits the development of the value-added MMS services.

MMS is the natural evolution of SMS. Because MMS delivers much richer content than SMS, MMS provide a friendly and vivid method for expression. However, the service model inherits from the MMS, and users have to compile the request message by themselves. And currently most of MMS applications only focus on how to transmit and present images, ring tones and text, but do not talk about how to make full use of MMS characteristics to enhance the user experience in MMS value added services. Especially in most of MMS applications attention is scarcely paid to provide or improve interaction services between end users and servers (e.g. MMS providing servers) and to aim at a MMS available on a server, and a more meaningful local interaction at users mobile terminal is impossible. For example, an associated operation on individual information items in a received multimedia message is not realizable. The

contents of multimedia message that can be displayed on a user terminal are limited and, the user needs either by repeating many times of operations or operating on the message displayed to get a further information, or by compiling request message and sending the message thus composed to the server to get more information. Needless to say, it is not only that the message contents that a user can get are limited, but that the procedure a user must take is boring and troublesome, all of these reduce the experiences a user get in multimedia messages.

As it is shown in Figure 2, where a MMS structure is simply illustrated, a multimedia message consists of MMS headers and a message body. The MMS headers contain such information on how to transfer the multimedia message from an original to a recipient, as an original address, destination address and etc. The message body consists of several parts including multimedia objects, such as image (jpeg format), text (plain format), audio (wav format), each in separate part, as well as the optional presentation part. The presentation part contains instructions to explain how the multimedia content should be rendered. In the prior art there are various alternatives of the computer presentation language, which deals with how to display presentations.

One of the presentation languages mostly used by those skilled in the art is Synchronized Multimedia Integration Language (SMIL). SMIL is a common deployment for MMS presentation. It is an important way to

integrate multimedia into Web content. SMIL is an extendible markup language (XML) based language. The XML language allows to describe timing indicated by multimedia, to associate supper-links with multimedia objects and to define the layout presented on the screen. SMIL is regarded as a way for enriching of the current text message based transmission technologies. SMIL consists of a set of modules that define the semantics and syntax for certain areas of functionality. These modules are layout module, timing and synchronization module and animation module. SMIL merely describes how to show a message on a screen, but it does not provide any interactive features for end users. So the SMIL needs to be extended to support interactive presentation, because interactive messages can provide good user experience to popularize the MMS technology to wider application areas.

Another presentation language mostly used by those skilled in the art is Hypertext Markup Language (HTML). The HTML is the most popular language supporting interactive presentation in Web applications. But the HTML form (a form presenting as a HTML document) cannot be used in MMS, because the HTML form cannot separate the content from the presentation, in other words, in a HTML form the presentation is often mixed with the data. As matter of fact, there are so many MMS clients with quite different capabilities, and the separation between the content and the presentation would make it possible to support different MMS

clients. This is a basic requirement for a MMS message presentation language. Furthermore, the protocol adopted in the network service program, for example the communication model of Hypertext Markup Language (HTML), is request/response. This model leads to more round trips between the service and the client's mobile terminal. MMS is a message system, which runs over wide-area wireless network. It is not a real-time message. If the request/response model could be implemented, the round-trip will bring huge latency and reduce the performance of the whole system. What is needed is to display a richer dynamic form in an optimum way on a MMS client's terminal.

SUMMARY OF THE INVENTION

In view of the above problems in the prior art the aim of the present invention therefore is to provide an interactive method for multimedia message services.

An object of the present invention is to realize an interactive multimedia communication between subscribers and a MMS back end system, for example a multimedia message providing server, preferably in response to an piece of multimedia message from a server a response message is generated automatically to be sent back to the server without a multiple round-trips between the user terminal and the server, and according to the present invention a flexible, richer and more convenient

local interaction at user terminal is possible.

Another objet of the present invention is to provide an optimized user interface of the MMS message for users. To this end one or more interactive controllers are embedded into the multimedia message, the user performs the local interaction of the user terminal as well as the interaction between the user terminal and the server (for example a multimedia message sending server).

Yet another objet of the present invention is to create a dynamic Web form, which is displayed on the user terminal, in XForms language, preferably a plurality of dynamic forms included in an single message presenting page to provide richer interactive presentations and more optimized multimedia messages for the user, to enhance his or her experience.

To achieve above objects according to the present invention an interactive method for multimedia message services is provided, comprising steps of:

receiving a multimedia message from a server;

generating a page displaying or playing the multimedia message at an user terminal, wherein one or more controllers are embedded into the displayed or played multimedia message and associations between said controllers are defined; and

triggering at least one action event and performing corresponding

action in response to the operations of one or more controllers.

In one embodiment according to the present invention, said trigged action event is to send back a response message to the server which renders said multimedia message; and in response to the operation of said controllers, automatically generating a response message for request to submit an order.

In another embodiment according to the present invention, said trigged action event is to modify the content of said multimedia message; and in response to the operation of said controllers, displaying or playing said modified content of said multimedia message.

Wherein the step of generating the page for displaying or playing a multimedia message further includes:

parsing the received multimedia message to obtain the presentation structure of said multimedia message; and

generating a data model used in the page for displaying or playing said multimedia messages based on said multimedia message presentation structure.

According to another aspect of the present invention, a user terminal for multimedia message service is provided, adopted to receive multimedia message from a sever and process said multimedia message, said user terminal comprises:

a device for receiving multimedia message from a server;

a device for generating a page for displaying or playing said multimedia message;

a device for embedding one or more controllers, between which relationships are defined, into said displayed or played multimedia message; and

a device for trigging at least one action event in response to an operation of said one or more controllers, and for implementing the corresponding action.

According to yet another aspect of the present invention, a communication system for multimedia message service is provide, said system comprising:

one or more user terminals;

one or more servers for sending a multimedia message to said user terminals, characterized in that said user terminal comprises:

a device for receiving a multimedia message from a server;

a device for generating a page for displaying or playing said multimedia message;

a device for embedding one or more controllers, between which relationships are defined, into said displayed or played multimedia message; and

a device for trigging at least one action event in response to an operation of said one or more controllers, and for performing the

corresponding action.

The interactive approach for the multimedia message service according to the present invention, the user terminal and corresponding communication system as well as the corresponding computer program provide a method for generating the value-added message based message for multimedia message providers, a friendly user interface, which enables a more vivid dynamic form to be presented in an optimum manner, for the MMS user, and a more convenient way to send a service request for the MMS user. According to the present invention the user can access more information while the round-trips between the server and the user mobile terminal are reduced without taking up too many system resources or causing latency. According to the present method, the performance of the message service system is improved.

BRIEF DESCRIPTION OF THE DRAWINGS

Those skilled in the art will appreciate that other advantages and features of the present invention will become appearance through the following description of particular embodiments referring to the accompanying drawings. Embodiments of the present invention are explained hereafter in details with reference to the accompanying drawings, in which:

Figure 1 schematically shows a SMS interface presented on a user

terminal;

Figure 2 schematically shows the message structure of conventional multimedia message;

Figure 3 schematically shows a block diagram of a MMS communication system employing the method of the present invention;

Figure 4 schematically shows the interactive procedure for the multimedia message service according to the present invention;

Figure 5 schematically shows the flow chart of the procedures of the interactive method for the multimedia message service according to the present invention;

Figure 6 shows logic models of the interactive controller according to the present invention;

Figure 7 shows one of the controllers according to the present invention;

Figure 8 schematically shows an example of the interactive multimedia message service implemented according to the present invention;

Figure 9 schematically shows a data model of the multimedia message according to the present invention;

Figure 10 schematically shows a data model of an exemplary multimedia message illustrated in a method for realizing the interactive approach for multimedia message service;

Figure 11 schematically shows a functional diagram illustrating an middleware process according to the present method.

DETAILED DESCRIPTION OF EMBODIMENTS

Hereafter a detailed description will be given to embodiments of the present invention with reference to accompanying drawings. It should be understood that the following description enables those skilled in the art to carry out present invention. Various changes and modifications will become apparent to those skilled in the art, and the teachings of the present invention can be applied to other embodiments. The present invention is therefore not intended to be limited to the exemplary embodiments described below.

Reference is now taken to Figure 3 which schematically shows a block diagram of a MMS communication system. The MMS communication system is adopted to activate the interactive multimedia message, realizing communication between a user mobile terminal and a server, for example a multimedia message server. A MMS communication system generally comprises of three main parts: a MMS value-added service server 300, a communication network and MMS center (MMSC) 200, and one or more MMS terminals 100. The value-added service server 300 provides and sends multimedia message, and can receive request in message form from the MMS terminal 100.

Preferably MMS value-added service serve 300 may comprise a communication module 301, a message parser module 302, and one or more service module 303. The communication module 301 is adopted to process various possible communication protocols, for example HTTP or SMTP. The message parser module 302 parses incoming request message, for example, from the MMS terminal 100 to derive the format and content of message to be presented, according to the association information contained in the message header, from the received message, and then passes the request message to a corresponding service modules 303. The service modules 303 are used to process the service logic. The communication network and MMSC 200 can be provided by suitable communication operator. The MMS terminal 100 may be any communication device, which allows multimedia message communication, either an individual multimedia communication device or various other communication devices which have the capability of carrying out multimedia message communication, and the corresponding hardware structure, the MMS terminal includes but is not limited to a mobile telephone, a personal digital assistant (PDA) and etc. In general, the MMS terminal 100 comprises a MMS module 110 for carrying out the multimedia user application program on the MMS terminal 100. Through running the multimedia user application program on the MMS terminal 100, the local interaction on the MMS terminal 100 and the

interaction between MMS terminal 100 and the server 300 are realized. Preferably, the MMS terminal 100 includes at least four components: a communication module 111, a parser module 112; an interactive module 113, and a storage module 114. Wherein the communication module 111 mainly process various MMS communication protocols so as to communicate with the server 300 via the MMSC 200. The parser module 112 parses the multimedia message received from the server, reads out the information in respect to the message format to be presented on the MMS terminal 100 and the related information, so as to carry out corresponding process on the message of various presentation format. Should, for example the received message format be pictorial one, a picture information is displayed according to the picture message format; an audio one, an audio message is played; and a textual one, the content of a text is displayed. The interactive module 113 carries out the associated operations corresponding with individual controllers listed in the multimedia message form, according to the relationship between the media objects, which have been parsed from the received multimedia message, to realize the local interaction on the MMS terminal 100 and the interaction between MMS terminal 100 and the server 300. The storage module 114 is used to store the received message and involved process results therewith.

Now reference is taken to Figure 4. Figure 4 schematically shows the

interactive procedure for the multimedia message service according to the present invention. Firstly, in procedure I00 the server 300 sends an interactive multimedia message to the MMS terminal 100 via a communication network and a MMSC 200. The message is, for example, sent once and may be permanently stored into the MMS terminal 100.

In procedure 120, a process of a local interaction on the MMS terminal 100 is shown. The local interaction process is a process that deals mainly with user operations, namely that the user performs operations, including adding, deleting, modifying, entering, selecting, searching and etc., on various forms provided on the user interface. Of course the user can either choose one or more from said operations, or perform none of them.

Depending on requirement, an interaction between a MMS terminal and a server is also realizable. In procedure I31, a request message comprising request message inputted or chosen by the user, is sent from MMS terminals 100 to service server. Preferably, a response message with the desired service is sent back to the server 300.

Hereafter, the interactive approach for multimedia message service is further explained in details with reference to Figure 5.

Figure 5 schematically shows the flow chart of the procedures of the interactive approach for the multimedia message service of the present invention. The procedure steps illustrated in the flow chart are mainly

performed through a MMS module assembly 110 in the above-mentioned MMS terminal 100, that is that the present invention is realized through performing the user application program, which runs on the MMS module assembly 110, in the communication module111, the parser module 112 and the interactive module 113. Of course the description of the embodiment is only given in an illustrative manner, and the present invention is not limited to the structures shown in the accompanying drawings.

Now reference is taken to figure 5. In view of the multimedia message (P1) from the multimedia message server 300, in step F2, the multimedia message is received by the MMS terminal 100 via MMSC200. Firstly, parser module 112 parses the presentation portion (P2) of the message out of the received message data. The presentation portion (P2) is frequently involved in the message content to be presented. Next, in connection with the presentation portion (P2) of the message, the presentation portion is further parsed in step F2, that is, an analysis is carried out in respect of the description about how to display the message. The presentation structure (P3) of the presented message, acquired therefrom, is the related message format to be presented on the MMS terminal. Besides, while parsing of the presentation portion of the message is carried out, the rules of relationship and activities between controllers is parsed and then the relationship and activities are embedded

in an action form (P8). Based on the parsed presentation structure (P3), in step F3, a data model (P4) of the presentation message or display message is created according to different message formats, such as a text format, an audio format, or a message format, which is preferably displayed in a Markup language. In view of the created data model (P4) for displaying or playing message, corresponding data are loaded and a message page (P5) is created in step F4. In step F5, the created message page is displayed or played on the MMS terminal 100. In view of the presented multimedia message the user performs operation on it, and in step F6 in response to a user operation an action event (P7) is created. And in step F8, an action listener is used to monitor the action event (P7), the action event is processed and a corresponding action is generated. The action listener is, in step 7, generated based on an action list defined for regulation regulations, resulted from the parsing of the presentation portion performed in step 2. In step 9, in view of the action (P7) monitored in step F8, an event-processing program is activated to process the user's action. The monitored actions are, for example, divided into two kinds, one is to change the contents (P10) on the message page on the MMS terminal. For this kind of action, step F5 is repeated, that is, the action is processed on the basis of the action rules defined in the action list, so as to display or play the changed massage page on the MMS terminal 100. The other is involved in the interaction with the service, in

step F10, on the basis of the new message model and the related data, if the event is an event involved in message delivery, a message is generated in accordance with the message model and the user's preference and then the generated message is sent to server 300.

According to the present invention when the MMS presentation model is created one or more interactive controllers are provided on a multimedia message presentation interface in which number of forms are provided. Said interactive controllers may be an submit button for an order form, a radio button, a check box, a text, a text field, a list box, an option menu and etc. Each of the controllers can be designated a name. When a form is submitted, the name and current value of a specific controller can be sent together with the form. By embedding controllers into the multimedia message, the user can express his or her preference to the service application program by means of these interactive controllers, to provide an interactive solution.

Now the reference is made to figure 6, which shows logic modules of the interactive controllers according to the present invention.

The present invention supports multimedia items throughout extending interactive controllers. The supported multimedia items may be image, audio and video. The items of the radio button, the check box, the list box and the option menu may be pictures, audio and video clips. Taken the option menu for example, the items of the option menu could

be pictures. Each picture represents an item. Take the multimedia options menu shown in Figure 7 as an example. In Figure 7 models of Nokia handsets, for example Nokia2110, Nokia5110, Nokia6110, Nokia7250 etc and pictures of the respective models of handsets are illustrated. The user can, for example, click a handset picture for one of the various models, and the handset of this model is displayed on the display screen of the user terminal, MMS terminal 100. The user can also move the slide box to display more Nokia models of handsets and pictures.

Hereafter descriptions will be given to the relationship between the interactive controllers proposed by the present invention. Logic modules are adopted to define relationships and actions. The relationship between the interactive controllers proposed by the present invention includes two kinds of relationships, namely LINK and CONTAIN. For example, if a LINK relationship exists between two or more interactive controllers, when one of the controller items is selected, all of others are selected too. Consequently, when one of the controller items is displayed, all of others are displayed or played too. As it is shown in Figure 6, when the model of a handset is changed from Nokia 5100 to Nokia7250, for every model of handsets their pictures and prices are changed in consequent respectively. CONTAIN is another relationship. For example, if the item 1 of the controller A contains items 1through 7 of the controller B, when item 1 of

the controller A is selected, only items 1 through 7 of the controller B can be selected.

According to the present invention, firstly the existing MMS system is extended to display a richer dynamic form on the user terminal, wherein the displayed individual controllers have certain association, preferably the relationship between controllers are defined as LINK relations or CONTAIN relations, to facilitate the user to operate on the displayed multimedia message, such that a convenient means for the interaction between the subscriber and the back end systems is provided. A user can select and input his or her preference by means of these interactive controllers, and the interactive controllers designed according to the present invention can automatically generate a response message based on the user's choice. The user pushes the order form submit button, and a response message is generated and sent out. For example, a response message, which contains an order request i.e. an order form, is generated automatically, and sent to the server. A common solution is provided to message servers/users to generate/operate on value added services by means of extending the MMS system. A very friendly user interface of the MMS message is provided to the user by means of using these interactive controllers. When the user selects different parameters, the message is displayed with a different presentation structure. In this manner, the user can accomplish a local interaction or an interaction with

a message server.

The extending of the existing MMS system according to the present invention is realized by embedding XForms technology into MMS presentation language. The current MMS standard is extended to enhance the interaction capability for the MMS message. The XForms is extended to support the multimedia interactive controllers. The relationship between the controllers is described by means of a XML based document. For example, the relation description is named Relationship XML (RXML). And a MMS middleware system is introduced to process the interactive multimedia message service.

XForms is an XML-based language, which defines form-based interaction interfaces. XForms is a renewal of the HTML form composed in the HTML language. XForms provides an extendable method to contain richer and more dynamic forms in the HTML file. By splitting a conventional HTML form into three parts, namely data model, exemplary data and user interface. The presentation is separated from the content, so a multiplex is allowed and more powerful input function is available. XForms and XMIL are all XML based languages. XForms can be integrated into SMIL. XForms provides various kinds of interactive controllers including a submit button, a radio button, a check box, a text, a text field, a list box, an option menu and etc.

These interactive controllers are extended to support multimedia

related objects. The present invention supports multimedia items through extending interactive controllers. The multimedia objects that can be supported, for example, may be pictures, audio and video clips. The items of the radio button, the check box, the list box and the option menu may be pictures, audio and video clips. Taking the option menu for example, an item of the menu is a picture. Each picture represents an item.

The relationship between the interactive controllers proposed by the present invention is described in XML language. According to the present invention the relationships between the interactive controllers are defined as two kinds of relationships. They are LINK and CONTAIN relations. The most commonly used relation is the LINK relation. For example, if there is a LINK relationship between two or more interactive controllers, when one of the controller items is selected all the other are selected too. Consequently, when one of the controller items is displayed all the rest items are displayed or played at the same time. CONTAIN means that, if the item 1 of the controller A comprises items 1through 7 of the controller B, when item 1 of the controller A is selected, only items 1through 7 of the controller B are selected.

Hereafter the relationships between the controllers defined by the present invention are further explained by means of examples.

Taking motorcycle shopping for an example, when a user receives a

motorcycle promotion message (refer to Figure 8, motorcycle promotion interactive message) and is interested in buying one. The user can preview the pictures and prices (LINK relationship) of different kinds of motorcycles simultaneously by simple select from the model options menu. In other words, as the user chooses a model of a motor the picture and the corresponding price are displayed in consequent. Furthermore, if a user wants to buy a model of motorcycle, a Buggy for example, what he needs is only to select the model and click the order form submit button (to submit an order form) as well.

Figure 9 schematically shows a data model of the present invention. Wherein, the object 1 is included in the object 2. The object 1 and the object 3 have an ally relationship. The attribute of the object 1 define those of the object 2. If the object 1 is changed from one condition to another, for example the attribute 1 changes, the object 2 and 3 are changed in consequence.

Figure 10 schematically shows a data model of an example of motorcycle buying. In the portion of presentation structure, the data model of the message shows five options including motor, models, and types of the wheels, pictures, prices and order form submit buttons of bicycles. Generally, instance data gives actual data on the basis of a data model. Two pieces of message may have the same data model but different instance data. In Figure 11, the instance data is information

about motorcycle promotion. The user interface defines the position, format and size of the individual items.

Relationship or action portion describes the relationship between the object and the action at the time an event takes place. Usually a message comprises information about one or more objects no matter how to present the information. Relationship or action portion describes the internal relationship between data and the internal relationship between the attributes. For example, one attribute is defined by other attributes or other attributes are defined by one attribute. There are also external relationships between the objects.

For example, in the relationship/action portion, the relationship between motor, models, pictures, prices and types of the wheels of bicycles is shown in Figure10. Motorcycle types have a group of models; therefor motorcycle objects include model objects. When a type of motorcycle is selected, models that belong to this type can be presented in the type option menu of this type (CONTAIN relationship). Each motorcycle model correspondents to a respective picture. But there are some types of wheels available for users as options. When a user pushes the order form submit button, a response message is composed by the MMS client application. The response message is generated on the basis of the push action.

To provide a friendly interaction feature so as to enrich the user

experience of the MMS value-added service, in the present invention, it is achieved by describing the service expression in extended XML language as following:

```
<?xml version="1.0" encoding= "ISO-8859-1"?>
<smil xmlns= "http://www.w3.org/2001/SMIL20/Language"
    xmlns: xfm= "http://www.w3.org/2002/01/xforms">
  <xfm: model id= "form1">
    <xfm: submitInfo id="submit 1" method2= "postxml"localfile= "temp.xml"
     target2= http://www.ibm.com/motopromote/"/>
     //attention A
     <xfm: instance xmlns="">
       <moto>
         <moto></moto>
         <model></model>
         <wheel></wheel>
       </moto>
     </xfm:instance>
</xfm:model>
<body>
  <par region="preference">
    <xfm:optionmenu ref="moto">
      <xfm: caption>1. Select the moto</xfm:caption>
      <xfm:item>Buggy</xfm:item>
    </xfm: option>
    <xfm: optionmenu ref="model">
      <xfm: caption>2.Select the model</xfm: caption>
      <xfm: item>Normal</xfm:item>
        <xfm: item>Model A</xfm:item>
        <xfm: item> Model B</xfm:item>
    </xfm: option>
    <xfm: optionmenu ref="wheel">
      <xfm: caption>3.Select the wheels</xfm: caption>
      <xfm: item>Normal</xfm:item>
      <xfm: item>Enhanced</xfm:item>
    </xfm: option >
  </par>
  <par region="submit">
    <xfm:submit name="submit" ref="moto" to="submit1">
      <xfm: caption>Submit</xfm: caption>
    </xfm: submit >
  </par>
```

```
        //the img region to display the motor picture
    <par region="imgRegion" dur= "indefinite"/>
      //attention B
      <xfm: optionmenu model=" picture" ref=" picture">
        <xfm: caption> </xfm:caption>
        <xfm: item>buggy.jpg</xfm:item>
        <xfm: item> buggy_ A.jpg </xfm:item>
        <xfm: item> buggy_ B.jpg </xfm:item>
      </xfm: option>
      <xfm: optionmenu ref="price">
        <xfm: caption> </xfm: caption>
        <xfm: item>$1250</xfm:item>
        <xfm: item>$1350</xfm:item>
        <xfm: item>$1399</xfm:item>
      <xfm: option >
    </par>
    </body>
  </smil>
```

The multimedia message service presentation uses SML and Xform to describe the message user interface. The interactive controllers are presented by XForms. When a MMS terminal client receives the message, the presentation is parsed and rendered to display the interactive motorcycle promotion message, which looks like Figure 8. For example, the sentence "Attention A" shows a response message format. When a user pushes the submit button, a response message is composed by MMS client application. The response message is as following.

```
<?xml version="1.0" encoding= "ISO-8859-1"?>
  <moto>
    <moto>Buggy</moto>
    <model>Normal</model>
    <wheel> Normal </wheel>
  </moto>
</xml>
```

In addition, the important feature of the application is the multimedia option menu, which shows the picture of the motors. The attention B in the sentences shows the presentation of multimedia interactive controllers.

Another important feature of the application is link relationship between controller modules. In this exemplary embodiment description is given to the LINK relationship between controllers of model, picture and price. When the user chooses a model from (Select the model) option menu, the corresponding picture and price of this model display at the same time. The COTAIN relationship is disclosed in the motor collection and the models. If the collection of a certain motor is selected, all models of the motorcycle collection can be seen in the following option menu. All other models, which do not belong to this motorcycle collection, can not be seen. The RXML and the multimedia controller items are shown in the following XML document.

```
//the relational XML describe the relation between the controllers
//the link relation
//attention C
<relation name="relation 1"
  <rxml: link>
    <item attr=xfm: optionmenu ref="model">
    <item attr=xfm: optionmenu model= "picture" ref="picture">
    <item attr=xfm: optionmenu ref= "price">
  </rxml: link>
  </rxml: instant attr=normal>
  </rxml: instant >
</relation>

//the contain relation
```

```
    //attention D
<relation name="relation 2">
  <rxml: contain>
    <item attr=xfm: optionmenu ref="moto">
    <containitem attr=xfm: optionmenu ref="model">
  </rxml: contain>
  </rxml: instant>
    <item attr=xfm: item>Buggy</ item >
    < containitem attr= xfm: item>Normal</ containitem >
    < containitem attr= xfm: item>Model A</ containitem >
    < containitem attr= xfm: item>Model B</ containitem >
  </rxml: instant >
</relation>
```

According to the present invention a MMS service middleware is designed for MMS service providers to push MMS messages to users, and process incoming MMS messages, for example from the MMS terminal, to provide value-added service. The sender of the message is authenticated by the authentication module, which uses the user management database to verify user. After the authentication, the message is parsed by a message parser. Then the message is passed on to the right message service for process via the service interface. When a service initiates a message, the message is verified by a push trigger and sent out via the MMS interface.

The user interface defines the size, form, position, show time, movement of interface parameters, and the interface defines how to add the data instances into the presentation of the pages. The user interface may be implemented with UI-wares. An UI-ware means a form, which can be displayed and interactive in a predefined mode. See Figure 11 for

a reference, the UI-ware shown can be an independent item such as text, picture, video, audio, or a form controller like button, check box, list box, radio button, option menu, input field. The items of the form controller can be text, picture, video or audio. The form controllers have the same interactive capabilities as normal HTML Form controllers or Xforms controllers. In the implementation, the specification XForms can be used here. The independent items have no redefined interactive capability, but their interactive capability can be added in relations/actions part. An interface parameter can be shown in diverse UI-wares. For example, an interface parameter with multiple-choice capability can be shown in a check box or a list box, because they are all multiple-choice controllers. The more important is, a data model can be rendered into diverse presentation for diverse MMS devices.

The interactive capabilities of interface parameters describes whether an interface can be display/play/edit/select, and whether it is of a single-choice or multiple choice. For example, a message can have two kinds of interface parameters. One is text, which can be input and modified. Another is an audio array. User can select one item from the array at a time and each of the items can be played.

Up to now, the interactive approach for multimedia message, user terminal and communication system of the present invention have been described in details by means of exemplary embodiments. It should be

understood that the present invention is not limited to the illustrated embodiment examples, on the basis of the description of the embodiments of the present invention, those skilled in the art can make various modifications and improvements according to the present invention, without departure from the spirit and scope of the present invention.

What we claim are:

1. An interactive method for multimedia message services comprising steps of:

receiving a multimedia message from a server;

generating a page displaying or playing the multimedia message at an user terminal, wherein one or more controllers are embedded into the displayed or played multimedia message and relationship between said controllers are defined; and

triggering at least one action event and performing corresponding action in response to the operations of one or more controllers.

2.The interactive method according to claim1, characterized in that the step of generating the page for displaying or playing a multimedia message further includes:

parsing the received multimedia message to obtain the presentation structure of said multimedia message; and

generating a data model used in the page for displaying or playing said multimedia messages based on said multimedia message presentation structure.

3.The interactive method according to claim1, characterized in that said trigged action event is to send back a response message to the server which renders said multimedia message; and

further includes a step of:

in response to the operation of said controllers, automatically generating a response message for request to submit an order.

4.The interactive method according to claim1, characterized in that

said trigged action event is to modify the content of said multimedia message; and

further includes a step of:

in response to the operation of said controllers, displaying or playing said modified content of said multimedia message.

5.The interactive method according to one of claims 1 to 4, characterized in that it further includes a step of:

said relationship includes at least one of the LINK relationship and the CONTAIN relationship.

6.The interactive method according to one of claims 1 to 4, characterized in that it further includes steps of:

parsing received multimedia message to obtain an action list of

related action rules;

listening in the trigged action events based on said action list.

7.The interactive method according to one of claims 1 to 4, characterized in that said multimedia message are composed in the language forms of XForms, XML, SMIL, XHTML or HTML.

8.The interactive method according to one of claims 1 to 4, characterized in that said controllers include one of a submit button, a selective button, a radio button, a check box, a text, a text field, a list box, an option menu.

9. A user terminal for multimedia message service, adopted to receive multimedia message from a sever and process said multimedia message, said user terminal comprises:

a device for receiving multimedia message from a server;

a device for generating a page for displaying or playing said multimedia message;

a device for embedding one or more controllers, between which relationships are defined, into said displayed or played multimedia message; and

a device for trigging at least one action event in response to an operation of said one or more controllers, and for implementing the corresponding action.

10. The user terminal according to claim 9, characterized in that the

device for generating the page for displaying or playing a multimedia message further includes:

a device for parsing the received multimedia message to obtain the presentation structure of said multimedia message; and

a device for generating a data model used in the page for displaying or playing said multimedia messages based on said multimedia message presentation structure.

11. The user terminal according to claim 9, characterized in that when said trigged action event is to send back a response message to the server which renders said multimedia message, in response to the operation of said controller, said means for triggering action event and for performing corresponding action automatically generates a response message for request to submit an order.

12.The user terminal according to claim 9, characterized in that when said trigged action event is to modify the content of said multimedia message, in response to the operation of said controller, said means for triggering action event and for performing corresponding action displays or plays said modified content of said multimedia message.

13. The user terminal according to one of claims 9 to 12, characterized in that said relationship includes at least one of the LINK relationship and the CONTAIN relationship.

14. The user terminal according to one of claims 9 to 12,

characterized in that it further includes

a device for parsing the received multimedia message to obtain an action list of related action rules;

a device for listening in the trigged action events based on said action list.

15. The user terminal according to one of claims 9 to 12, characterized in that said multimedia message are composed in the language forms of XForms, XML, SMIL, XHTML or HTML.

16. The user terminal according to one of claims 9 to 12, characterized in that said controllers include one of a submit button, a selective button, a radio button, a check box, a text, a text field, a list box, an option menu.

17. A communication system for multimedia message service, said system comprises:

one or more user terminals;

one or more servers for sending a multimedia message to said user terminals, characterized in that said user terminal comprises:

a device for receiving a multimedia message from a server;

a device for generating a page for displaying or playing said multimedia message;

a device for embedding one or more controllers, between which relationships are defined, into said displayed or played multimedia

message; and

a device for trigging at least one action event in response to an operation of said one or more controllers, and for performing the corresponding action.

18. The communication system according to claim17, characterized in that the device for generating the page for displaying or playing a multimedia message further includes:

a device for parsing the received multimedia message to obtain the presentation structure of said multimedia message; and

a device for generating a data model used in the page for displaying or playing said multimedia messages based on said multimedia message presentation structure.

19. A computer program for running on a user terminal within a multimedia communication system, wherein said communication system comprises one or more user terminals, and one or more servers for sending a multimedia message to said user terminals, said computer program runs on said user terminal for performing following steps:

receiving a multimedia message from a server,

generating a page for displaying or playing said multimedia message; wherein one or more controllers are embedded into said displayed or played multimedia message and associations between said controllers are defined; and

in response to an operation of said one or more controllers, triggering at least one action event and performing the corresponding action.

20.The computer program according to claim19, characterized in that the step of generating the page for displaying or playing a multimedia message further includes

parsing the received multimedia message to obtain the presentation structure of said multimedia message; and

generating a data model used in the page for displaying or playing said multimedia messages based on said multimedia message presentation structure.

21.The computer program according to claim19, characterized in that further includes the step of:

when said trigged action event is to modify the content of said multimedia message, in response to the operation of said controller, automatically generating a response message for request to submit an order.

22.The computer program according to claim19, characterized in that when said trigged action event is to modify the content of said multimedia message, in response to the operation of said controller, displaying or playing said modified content of said multimedia message.

23.The computer program according to one of claims 19 to 22,

characterized in that it further includes step of:

at least one of a LINK relationship and a CONTAIN relationship is established between said more controllers.

24. The computer program according to one of claims 19 to 22, characterized in that it further performs following steps

parsing received multimedia message to obtain an action list of related action regulations;

listening the trigged action events based on said action list.

25. The computer program according to one of claims 19 to 22, characterized in that said multimedia message are composed in the language forms of XForms, XML, SMIL, XHTML or HTML.

Abstract

The present invention relates an interactive method, a user terminal and a communication system for multimedia message services. Said method comprises steps of receiving a multimedia message from a server; generating a page displaying or playing the multimedia message at an user terminal, wherein one or more controllers are embedded into the displayed or played multimedia message and associations between said controllers are defined; and triggering at least one action event and performing corresponding action in response to the operations of one or more controllers. According to the present invention, a response message fed back to the server is automatically generated at the user terminal, and a optimized multimedia message interface is provided for the user, a local interaction and a interaction between the terminal and the back end service can be flexibly realized.

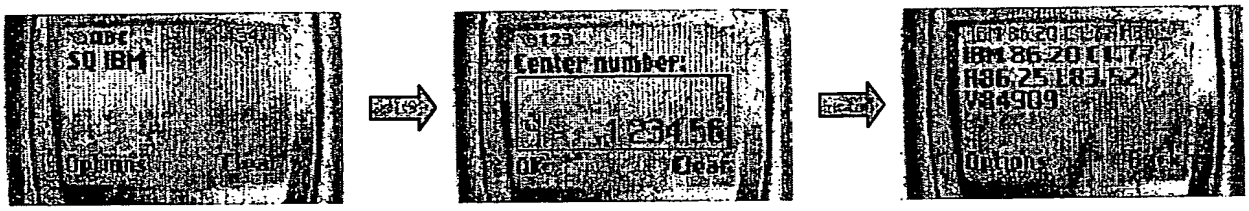

SQ IBM
Options
Clear
Center number:
OK
Clear
IBM 86-20
Options

Fig. 1

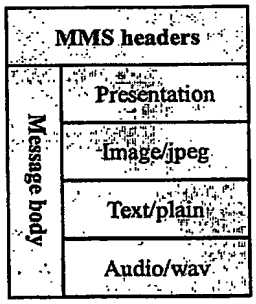

MMS headers
Message body
Presentation
Image/jpeg
Text/plain
Audio/wav

Fig. 2

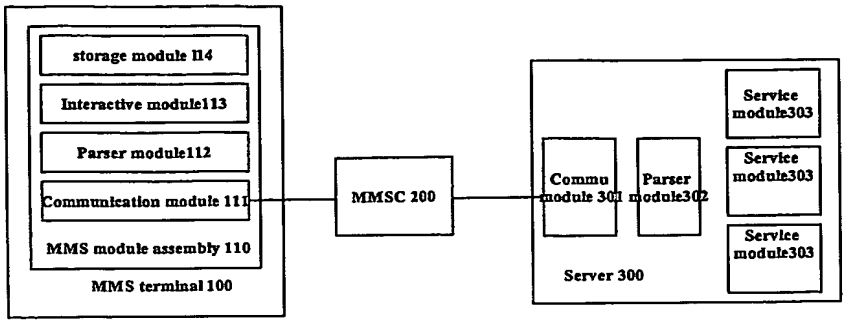

storage module 114
Interactive module113
Parser module112
Communication module 111
MMS module assembly 110
MMS terminal 100
MMSC 200
Commu module 301
Parser module302
Service module303
Service module303
Service module303
Server 300

Fig. 3

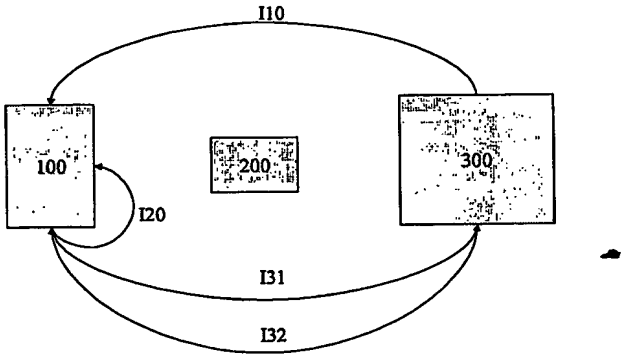

I10
100
200
300
I20
I31
I32

Fig. 4

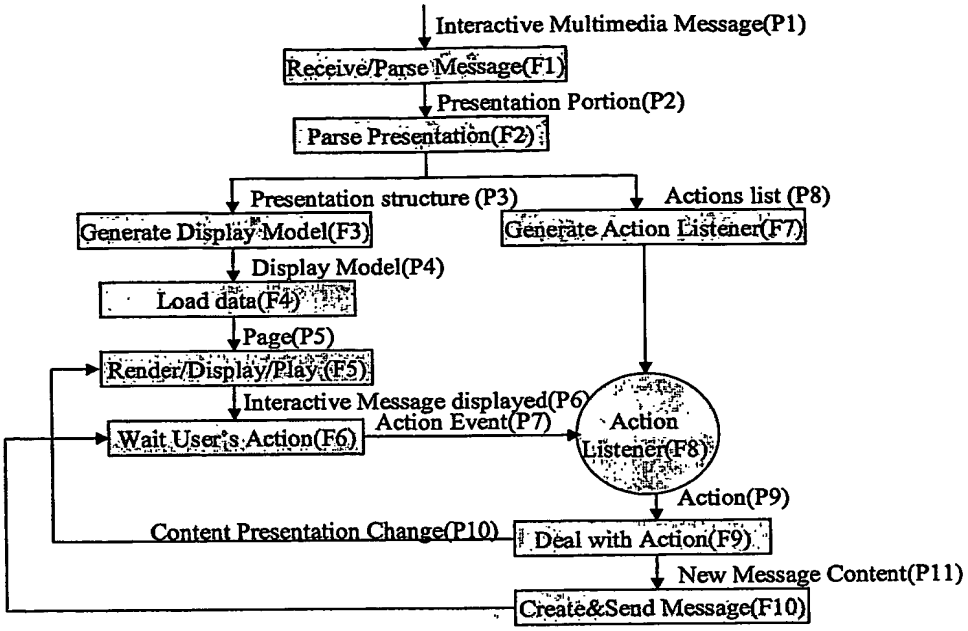

Interactive Multimedia Message(P1)
Receive/Parse Message(F1)
Presentation Portion(P2)
Parse Presentation(F2)
Presentation structure (P3)
Actions list (P8)
Generate Display Model(F3)
Generate Action Listener(F7)
Display Model(P4)
Load data(F4)
Page(P5)
Render/Display/Play (F5)
Interactive Message displayed(P6)
Action Event(P7)
Wait User's Action(F6)
Action Listener(F8)
Action(P9)
Content Presentation Change(P10)
Deal with Action(F9)
New Message Content(P11)
Create&Send Message(F10)

Fig. 5

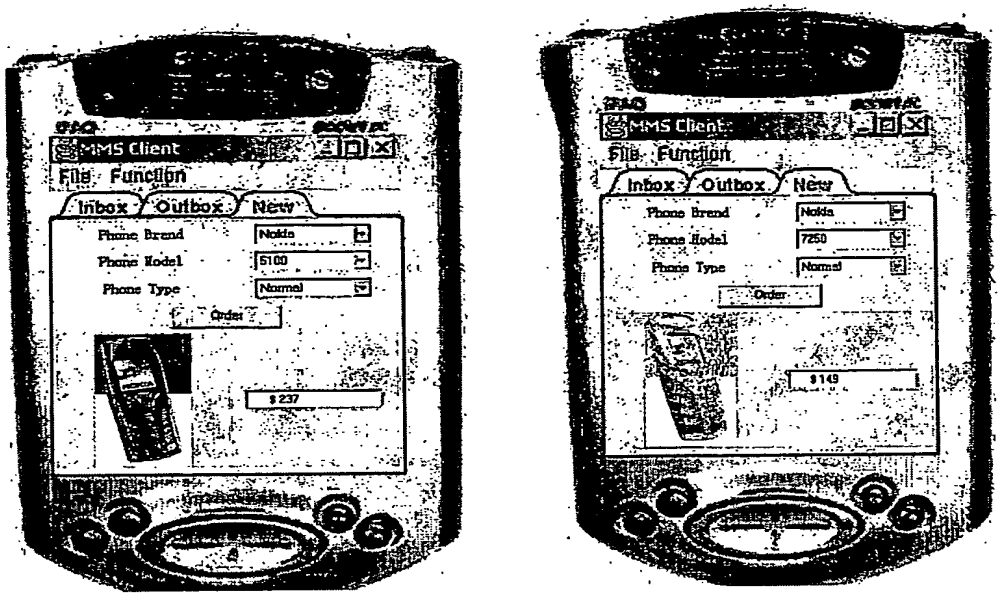

MMS Client
File Function
Inbox
Outbox
New
Phone Brand
Nokia
Phone Model
5100
Phone Type
Normal
Order
$ 237
MMS Client
File Function
Inbox
Outbox
New
Phone Brand
Nokia
Phone Model
7250
Phone Type
Normal
Order
$149

Fig. 6

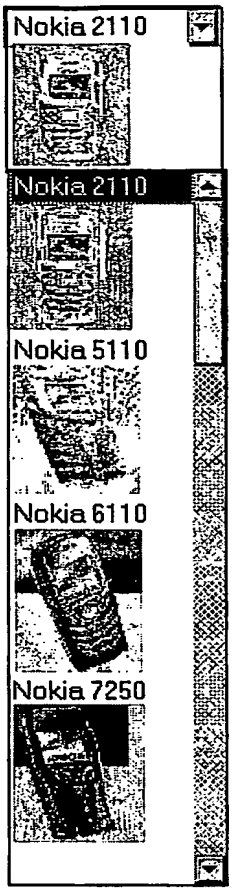


Fig. 7


MMS Client
File Function
Inbox
Outbox
New
1. Select the motor:
Buggy
2. Select the model:
Normal
3. Select the wheels:
Normal
4. Submit order:
Order
$-1250

Fig. 8

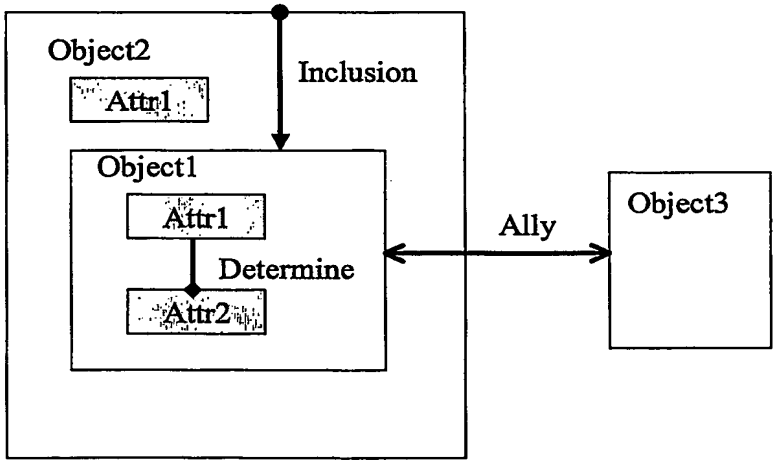

Object2
Attr1
Inclusion
Object1
Attr1
Determine
Attr2
Ally
Object3

Fig. 9

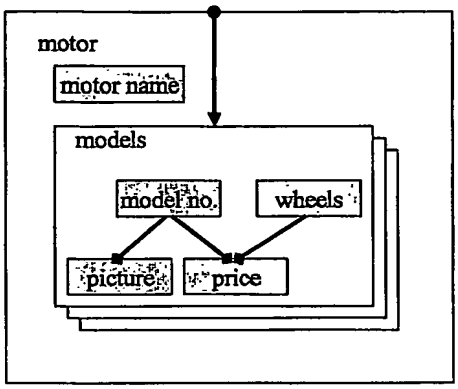

motor
motor name
models
model no.
wheels
picture
price

Fig. 10

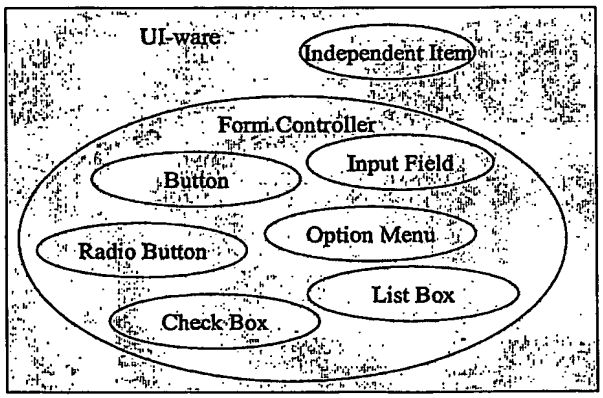

UI-ware
Independent Item
Form Controller
Input Field
Button
Option Menu
Radio Button
List Box
Check Box

Fig. 11

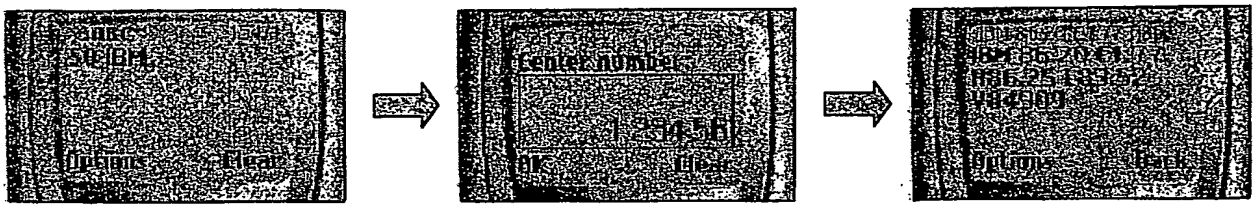

Options
Clear
center number
OK
Clear
Options
Back

Fig. 1

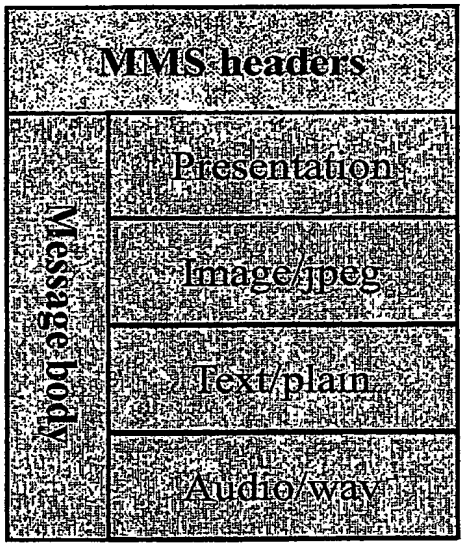

MMS headers
Message body
Presentation
Image/jpeg
Text/plain
Audio/wav

Fig. 2

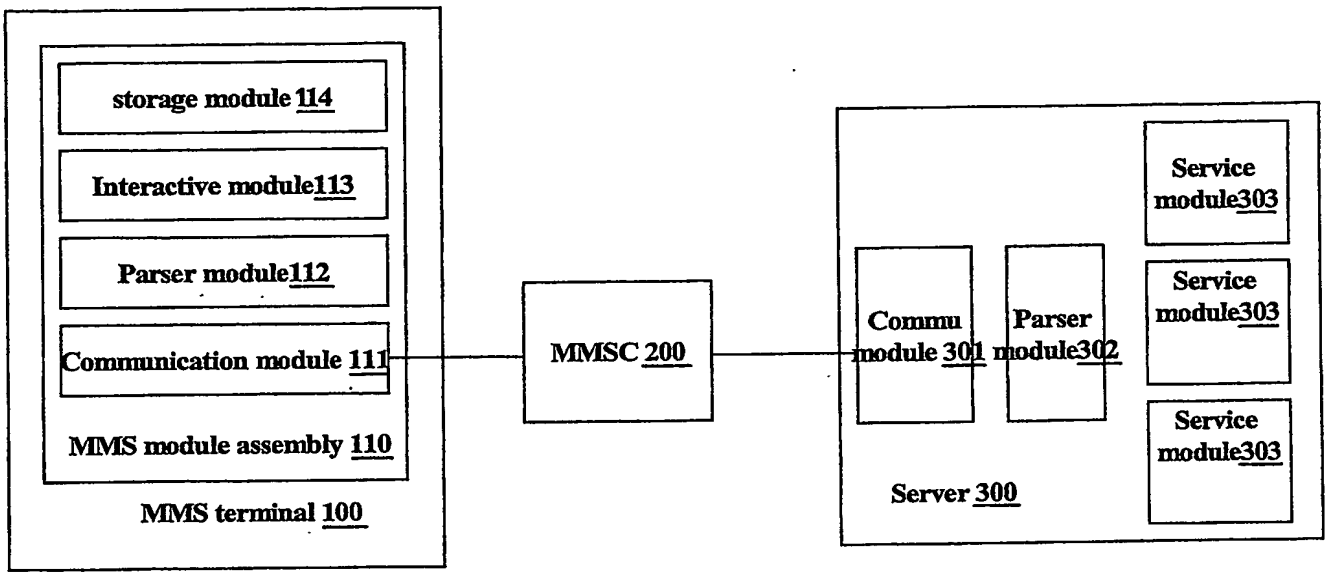

storage module 114
Interactive module113
Parser module112
Communication module 111
MMS module assembly 110
MMS terminal 100
MMSC 200
Commu module 301
Parser module302
Service module303
Service module303
Service module303
Server 300

Fig. 3

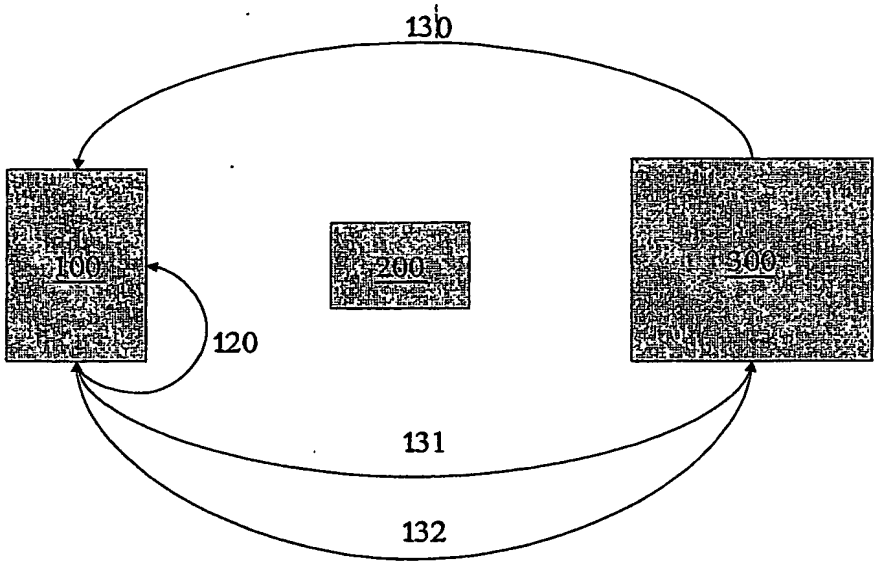
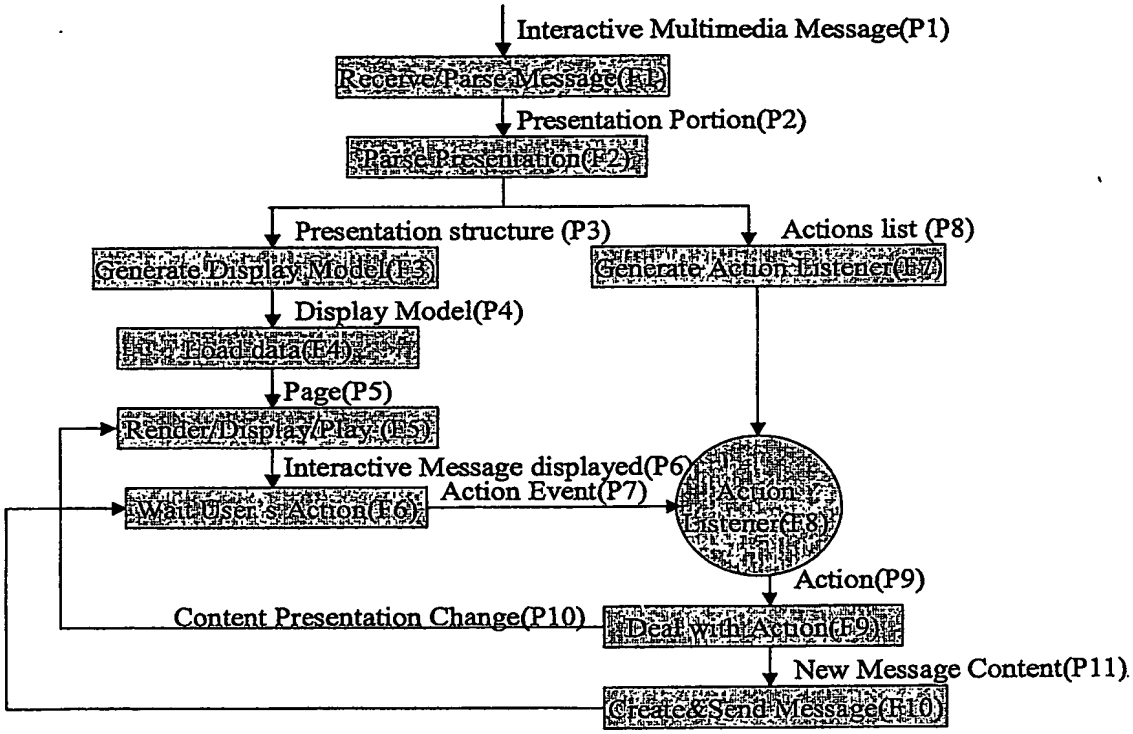


Fig. 4


Interactive Multimedia Message(P1)
Receive/Parse Message(F1)
Presentation Portion(P2)
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Interactive Message displayed(P6)
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Action Listener(F8)
Action(P9)
Content Presentation Change(P10)
Deal with Action(F9)
New Message Content(P11)
Create & Send Message(F10)

Fig. 5

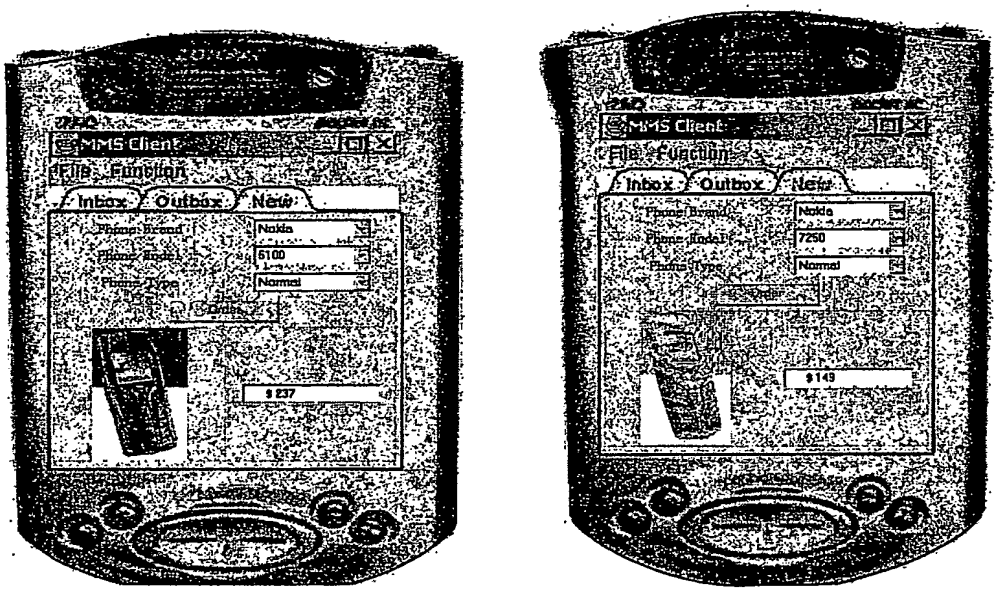
MMS Client
File Function
Inbox
Outbox
New
Nokia
6100
Normal
$ 237
MMS Client
File Function
Inbox
Outbox
New
Nokia
7250
Normal
$ 149

Fig. 6

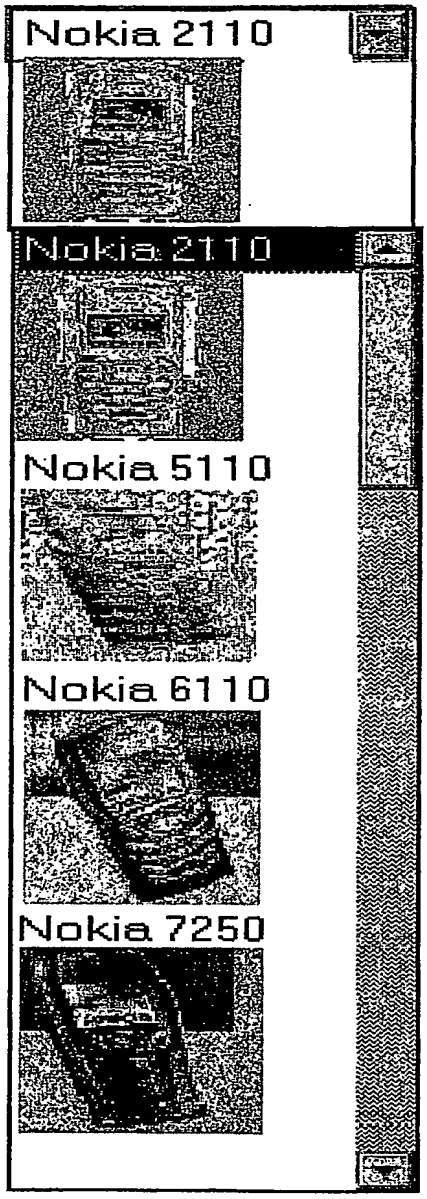

Fig. 7

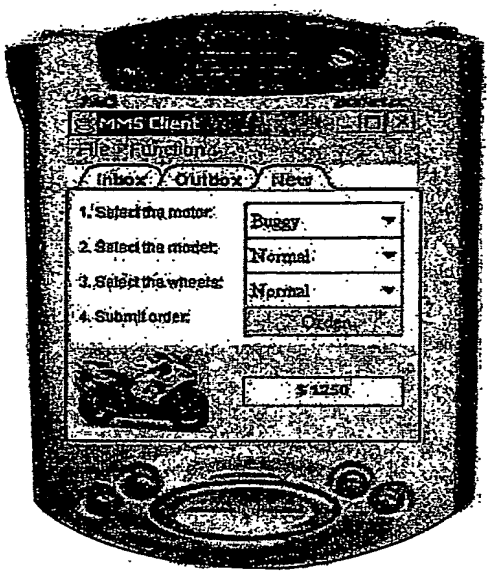
MMS Client
Inbox
Outbox
New
1. Select the motor:
Buggy
2. Select the model:
Normal
3. Select the wheels:
Normal
4. Submit order:
Order
$ 1250

Fig. 8

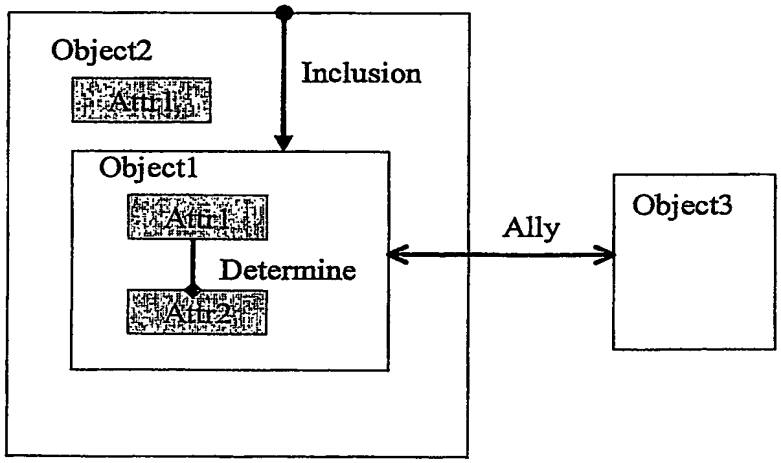
Object2
Attr1
Inclusion
Object1
Attr
Determine
Attr2
Ally
Object3

Fig. 9

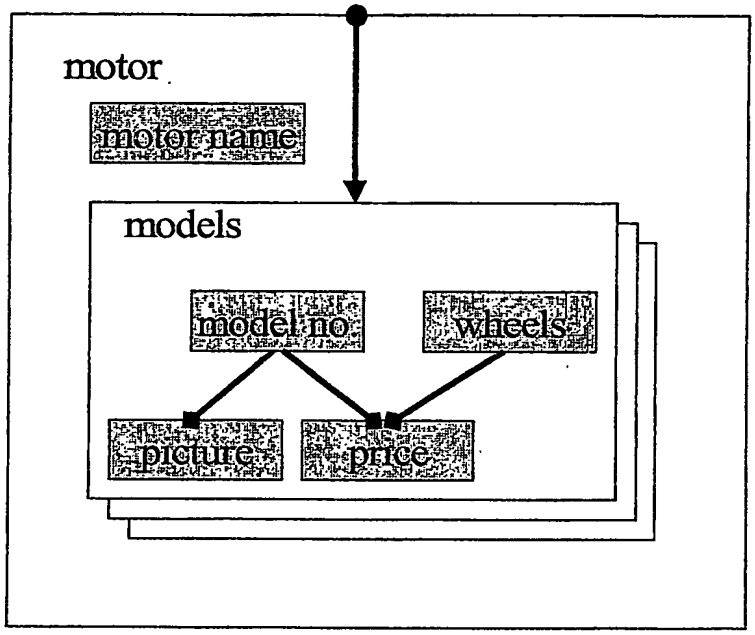

Fig. 10

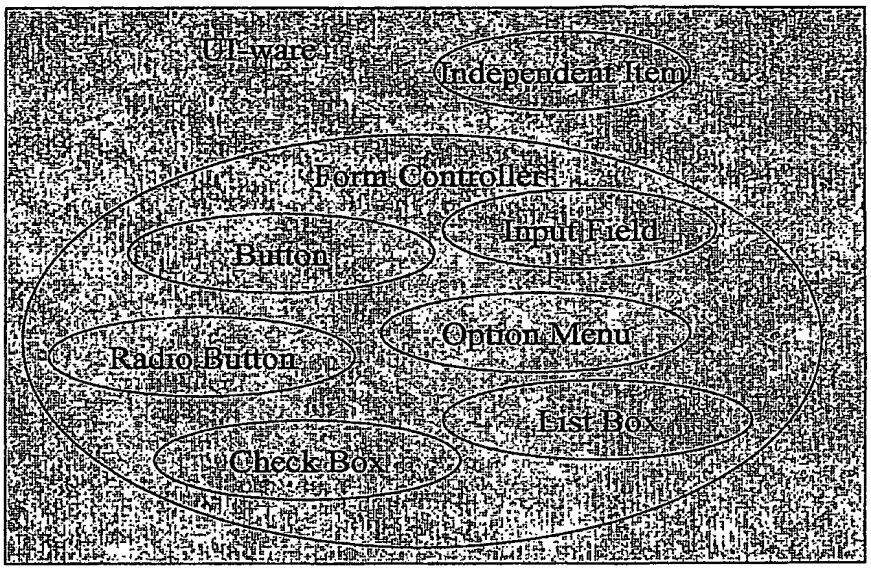
GUI-ware
Independent Item
Form Controller
Input Field
Button
Option Menu
Radio Button
List Box
Check Box

Fig. 11